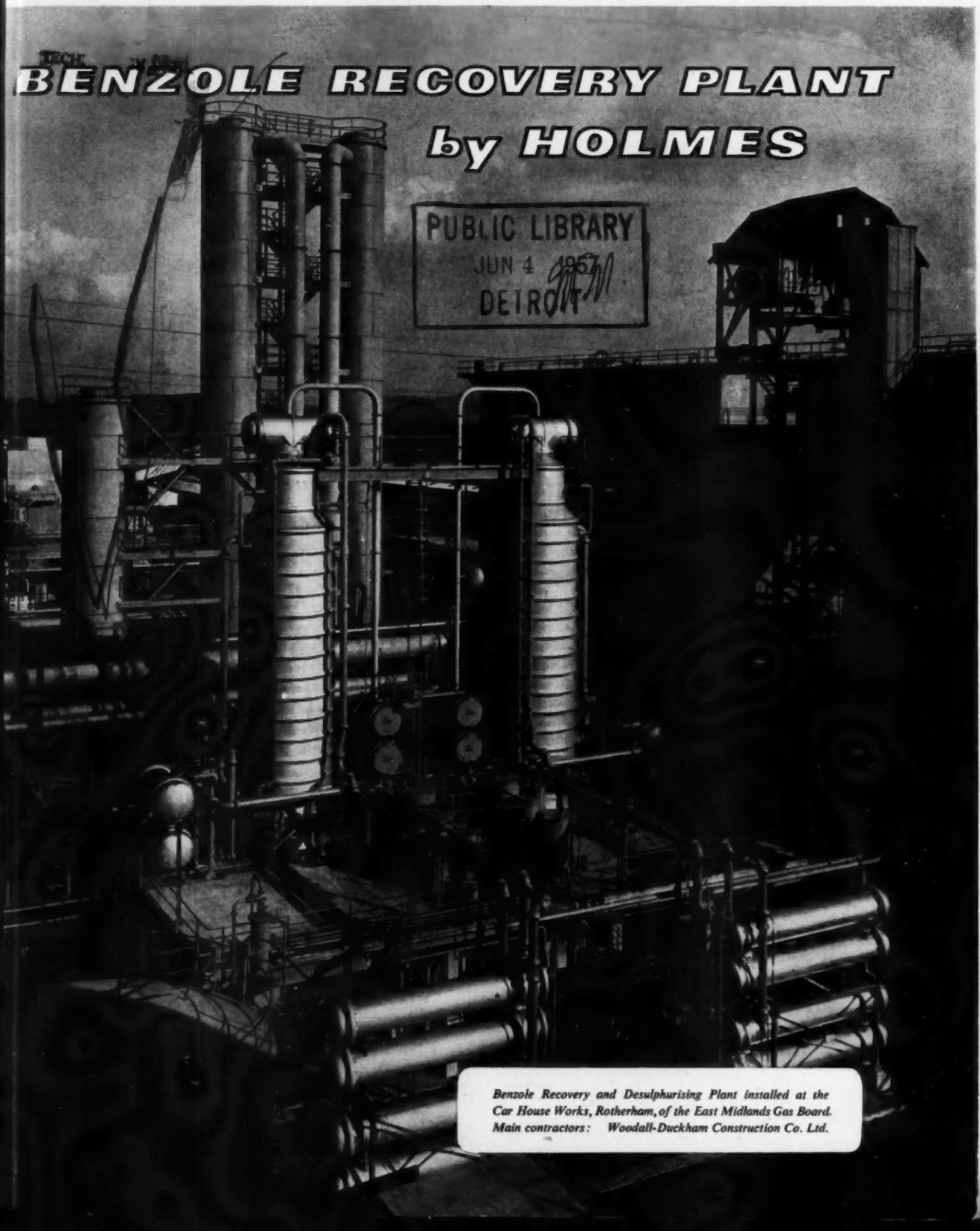
Gas Journal

VOL. 290. 109th YEAR. LONDON, MAY 15, 1957. Nº 4896. PRICE 1/6



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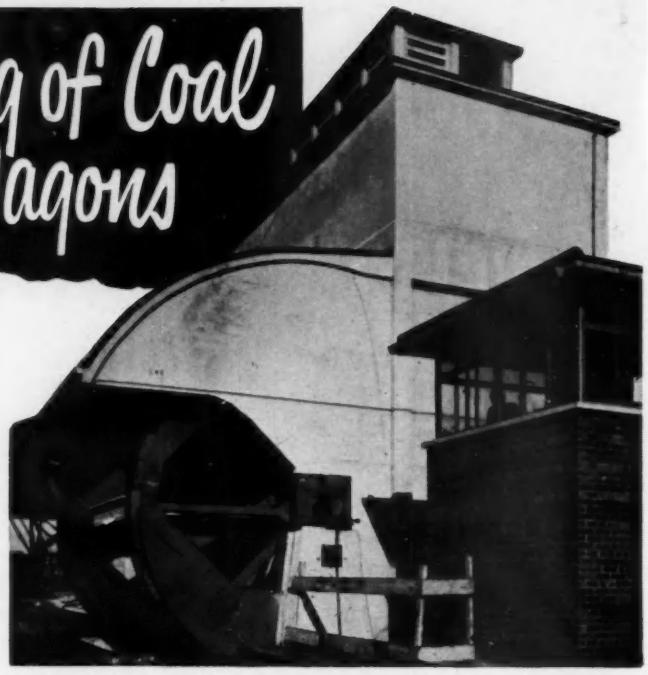

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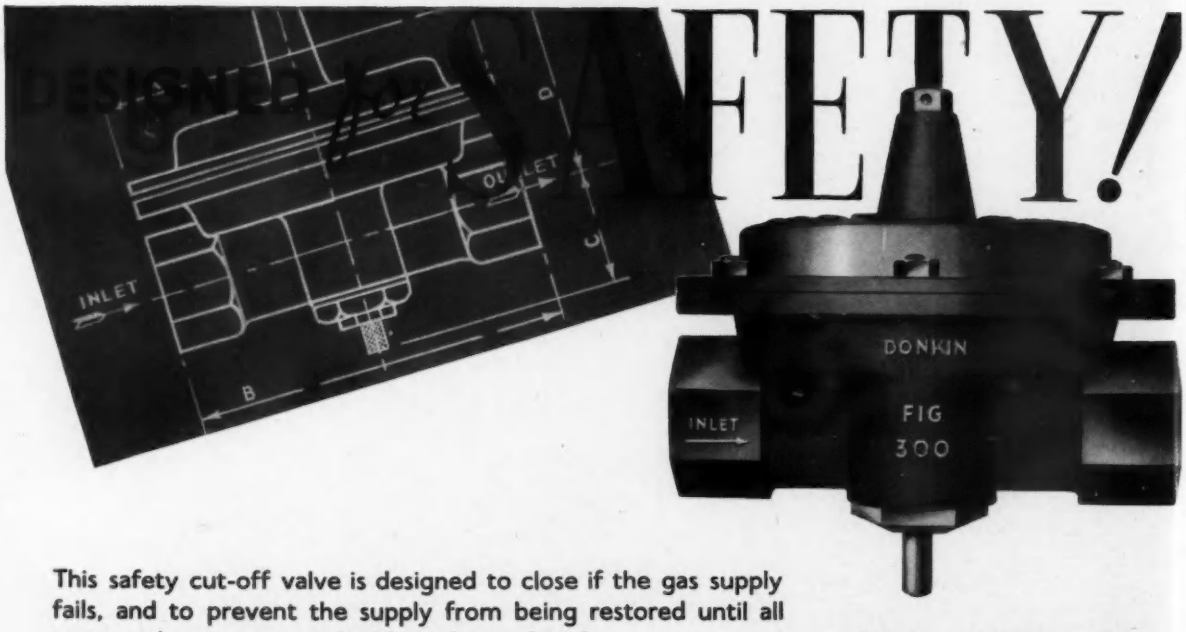

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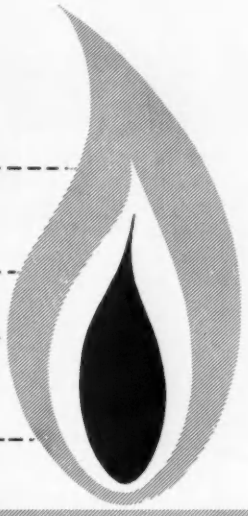

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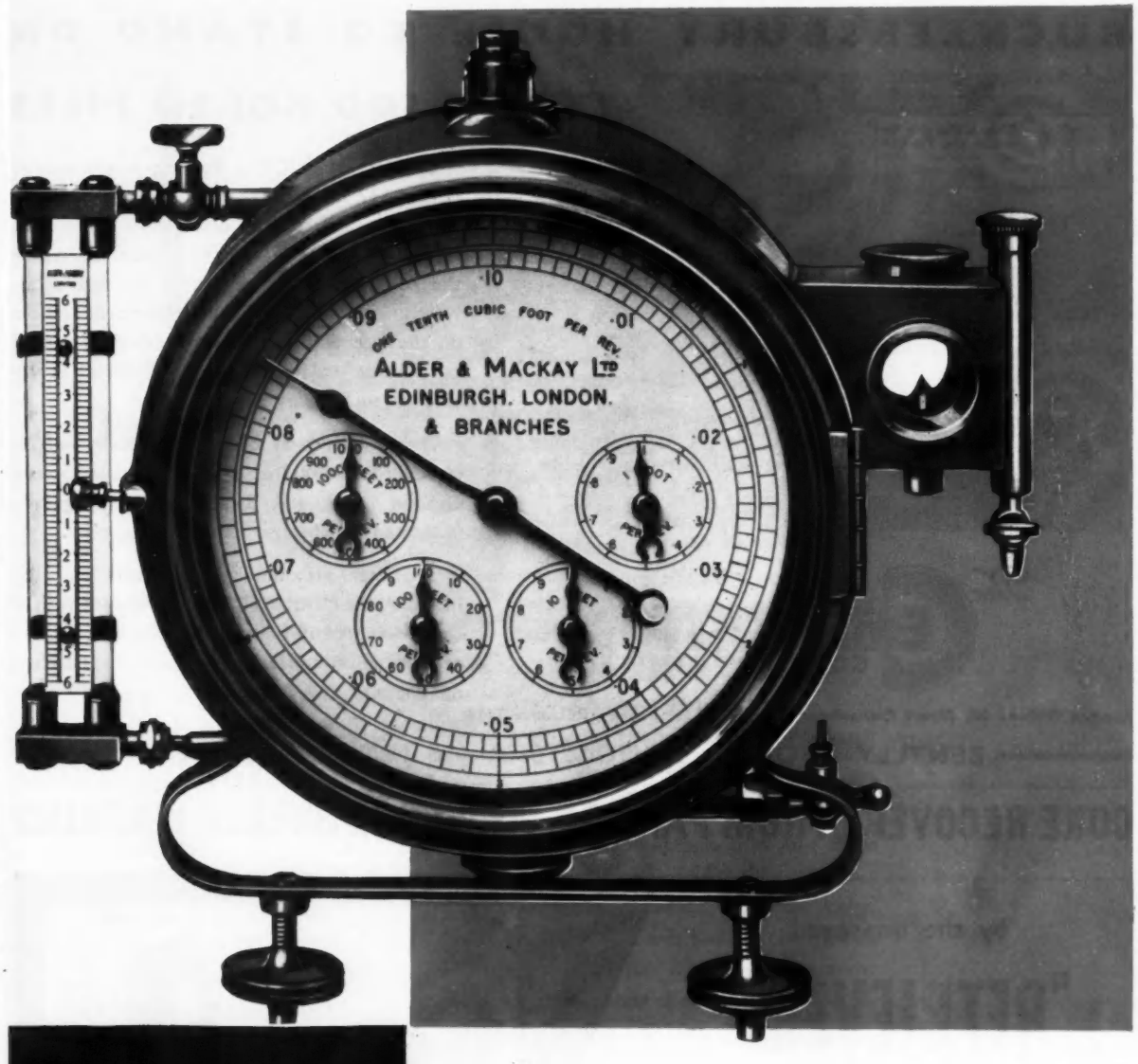

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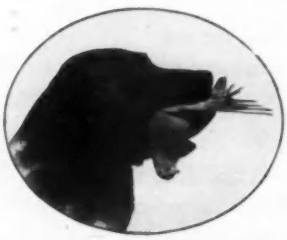

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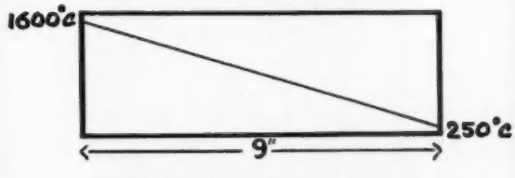

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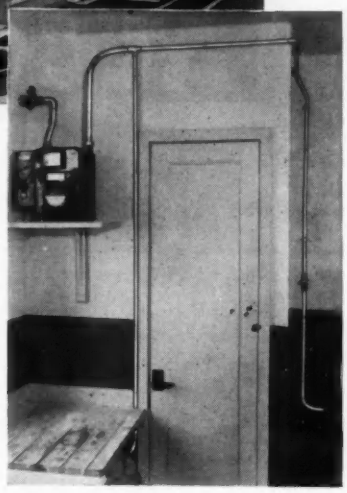

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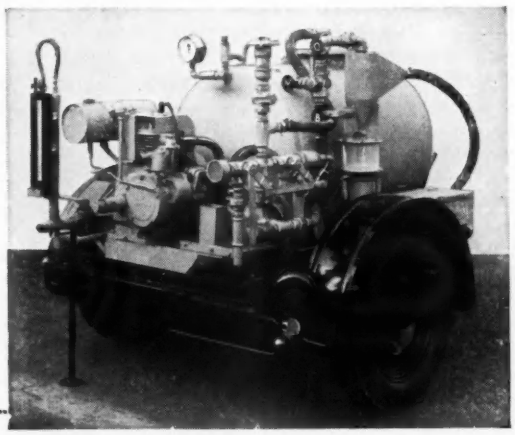

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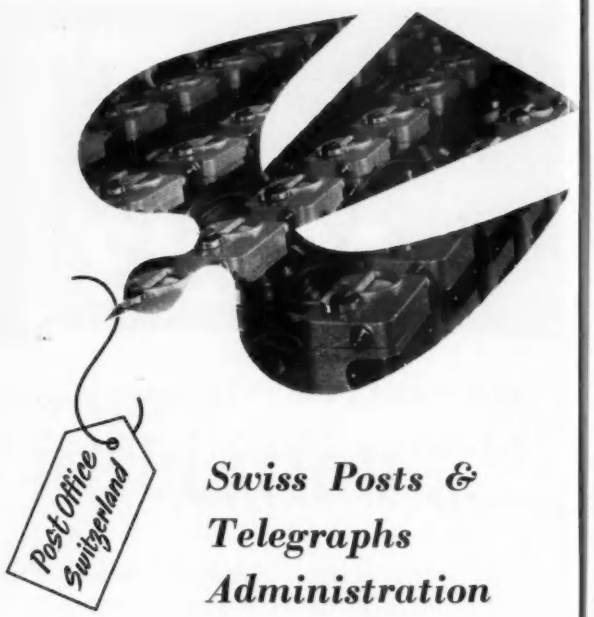

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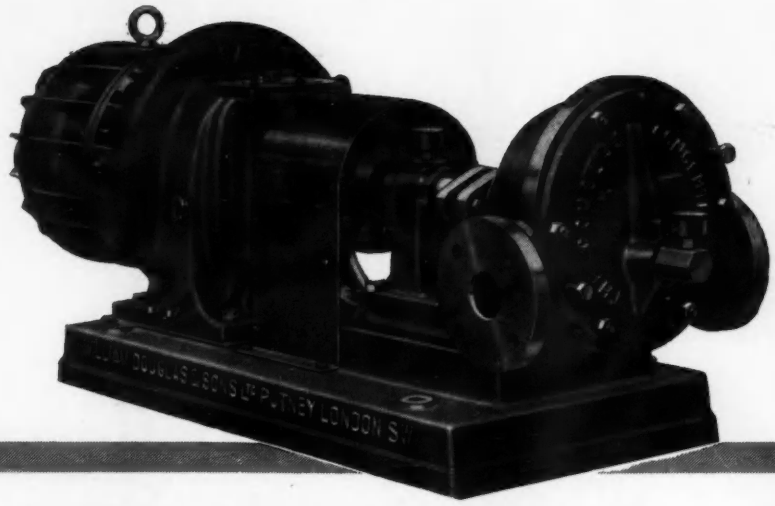

This list of fluids shows the versatility of the Douglas Pump

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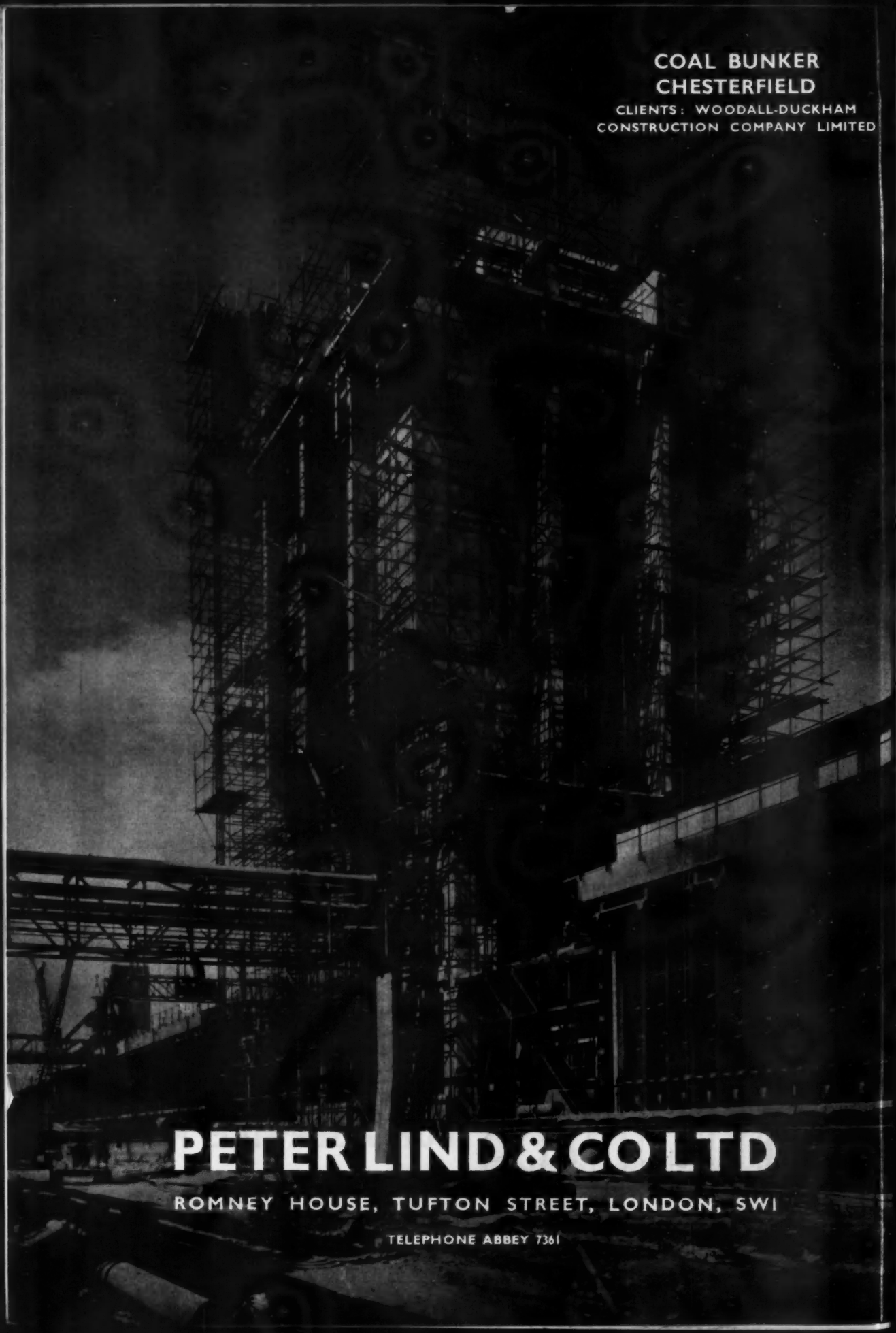
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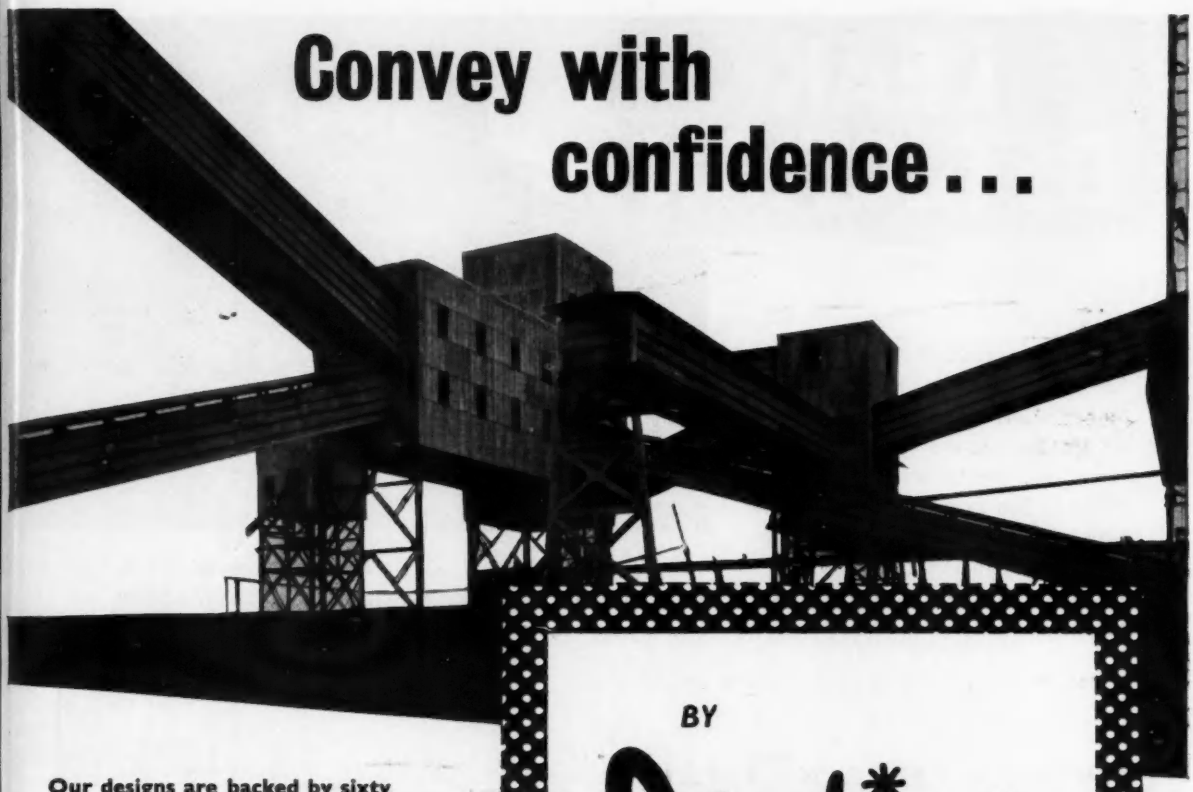

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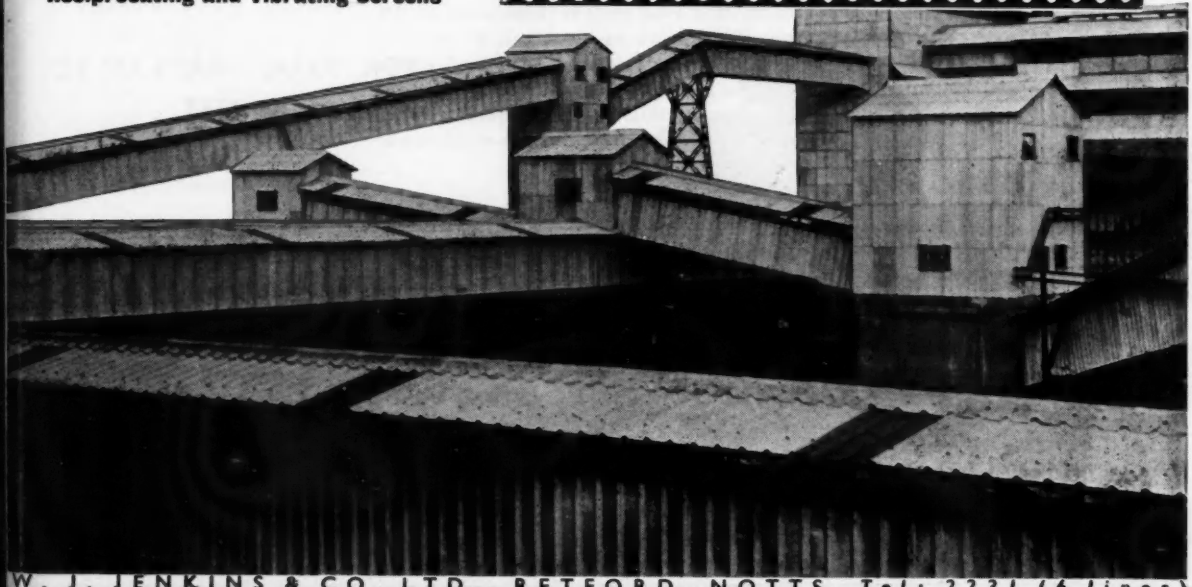

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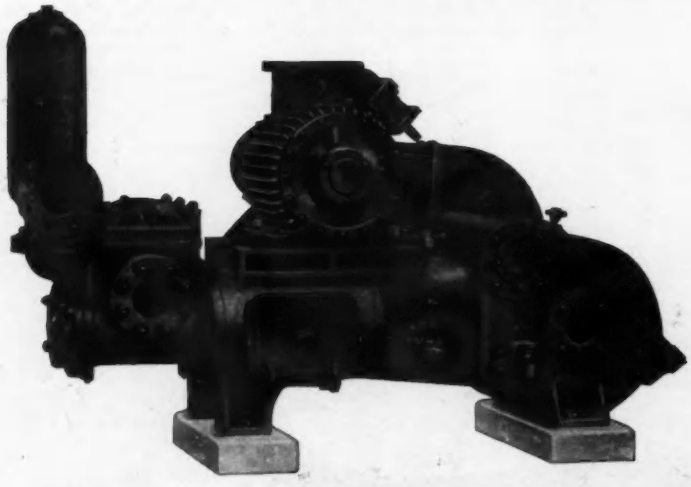

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Gas Journal

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109TH YEAR

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Gas Journal

VOLUME 290. No. 4896. MAY 15, 1957. 109th YEAR

Ireland—a Time for Action

THE difficulties which have beset the gas industry in Ireland in recent years are fast coming to a head. On the one hand coal prices continue to rise, while on the other competition from electricity becomes increasingly severe. Unless something is done either to relieve economic pressure on the industry or to increase its manufacturing and sales efficiency, the future is not bright. The first step towards solving the problem is the determination to face it, and it is just this which has been lacking in the past. There have been complaints and lamentations but little action. The meeting of the Irish Gas Association in Wexford last week was notable for the fact that at last there appeared unmistakable signs of a new spirit, a new effort to weather the gathering storm. Credit is due to Mr. J. K. Cantwell for tackling the subject firmly in his address (see report on p. 321) and it is to be hoped that during the coming year certain of his suggestions will be adopted.

Chief among these was the idea that Government aid (presumably Mr. Cantwell was thinking primarily of the South) might be forthcoming in order to carry out very necessary modernisation in gasworks. Few of the, predominently small, undertakings have sufficient surplus revenue available and undoubtedly new capital would be difficult to raise. In Mr. Cantwell's view the Government's 'strongly expressed desire' to build up the strength and industry of small towns and villages in order to offset forced emigration by providing local employment should encourage it to look sympathetically upon the gas industry's problems. 'The matter is, first, one for individual undertakings to assess their requirements, but where cases for capital assistance exist . . . our Association is well placed and the proper medium through which collective representations should be made.' Although it is unlikely that the Parliamentary Secretary to the Minister for Industry and Commerce, who was one of the principal guests at the Association's annual dinner, was aware of the President's suggestion, he nevertheless carried the idea a stage further by indicating that, at least in so far as the price of coal was concerned, the Minister's offices would be 'very readily' placed at the disposal of the Association and the Irish Gas industry.

So much for obtaining financial assistance; there remains the problem of making the best use of it. By a happy coincidence—or, we would like to think, by careful design—the paper presented at the meeting was singularly appropriate. 'Efficiency and Economics of Coal Carbonisation' by A. F. Cottrell and T. W. Austen, of the Woodall-Duckham organisation, indicated several ways in which the operating costs of gasworks may be reduced. To some this paper, which will be published in the 'GAS JOURNAL' in due course, might appear somewhat elementary, but as the discussion at the meeting revealed, if it erred it was on the side of complication. Clearly some engineers present were being 'blinded by science' and it was fortunate that in their answers to questions the authors succeeded in talking their language. There is little doubt that their remarks made an impression on their audience and opened vistas of increased efficiencies which provided food for thought.

Manufacturing efficiency is only half of the question, however. There remains the equally important matter of selling the product and in this Irish gas undertakings show little evidence of proficiency. Advertising, display and sales initiative are properly utilised in only a handful of the more progressive companies and it would appear that little opposition is given to the business-like attack of the electricity supply board. However, here again there are signs of progress and a co-operative scheme with the principal appliance manufacturers is under discussion.

The whole situation is both distressing and irritating. So much could be done by joint effort and real determination but, despite the encouraging signs revealed at the Wexford meeting, there is still a lack of grip and an enveloping apathy. Works are in poor shape, partly it is true because mounting coal costs are swallowing the modest profits, but also because little is being done to preserve existing assets, let alone acquire new ones. If some real effort is made to seek financial aid and give proof that this assistance would be put to good use,

then Mr. Cantwell's presidency would be remembered with gratitude indeed.

In the above notes we have dealt with the major issues underlying the meeting, but it is only fair that we should report the fact that this gathering was well up to the Association's usual high standard of entertainment and bonhomie. The Association has many members from among the traders, a large proportion of whom cross 'the channel' for the meeting. It says much for the warmth of the welcome and the intoxicating quality of the air—yes, the air—that even the most staid English delegate is found to harbour some hitherto unsuspected trace of Irish blood.

The N.W.G.B. and the Press

EVERY year the North Western Gas Board entertains the city editors of the country's leading newspapers to lunch. This year the event took place in the pleasant setting of the Tallow Chandlers' Hall, which was rebuilt after the Great Fire of London in 1678, and sports an Adam ceiling, wood carvings by Grinling Gibbons, and a Charles I chair for whomsoever may preside.

As in previous years, the Chairman of the North Western Gas Board, Mr. D. P. Welman, with his senior officials, acted as host and took the opportunity of explaining to the Press the aims of his Board and the success with which he has been carrying out certain of the Board's policies. Since the Report and Accounts of the Board had not yet been presented to the Gas Council, it was not possible for Mr. Welman to quote exact figures from this report but he was able to give a broad outline of the year's working up to the end of March, 1957. The location of industry in Lancashire and Cheshire forms an industrial belt in which there is a sufficiently dense population and a great enough demand for gas to make possible an integrated grid system which has both kept the price of gas within reasonable bounds and made possible its manufacture in large units at a much higher efficiency. Even so, the Board was faced with greatly increased costs when it surveyed the prospects for the financial year 1956-57 and it had come to the conclusion that something like £1 mill. would have to be found from somewhere if it was not to be involved in a deficit. This the Chairman said had been successfully overcome by operating at increased efficiency and reducing personnel where it could be spared. A point that was stressed by the Chairman was that although the gas industry might be nationalised, that is to say that the capital was publicly owned through a special type of Government stock, he for one looked upon his Board as a large concern to be run as if it were any other industrial undertaking operating under private enterprise. This seemed both an unexpected but decidedly acceptable view to take and caused one of the guests to ask whether the North Western Board would be happy and confident in going to the City for its next injection of capital instead of to the Treasury as nationalised industry has the privilege of doing. The fact that Mr. Welman was not only perfectly prepared to do so but was equally confident that the money would be forthcoming without any difficulty, may have caused his hearers something of a surprise. It did, however, confirm the Board's abundant confidence in the future of the industry. The Chairman's remarks on the cutting down of men employed by as much as 2,000 during the year seemed to be yet a further step in the Board's aim for greater efficiency, but this too did not pass either unnoticed or unchallenged by his hearers. How could anything so drastic be done, and done as a matter of course? This the Chairman said was easily explained because the Board had a most liberal and enlightened policy towards its employees at all levels. Before any works was closed down or before any step was taken which might dislocate labour, there was full consultation with the Trades Union concerned and the whole matter was clearly explained to those likely to be affected. The machinery for doing this was the consultative councils in each of the groups at which the men's elected representatives could meet the management.

The working of such councils is particularly smooth in this Board's area and has culminated in two conferences, the second of which was held at Blackpool last year. Such conferences had at one time been written off by critics as doomed to failure, said Mr. Welman, but this had not been so; instead both, and especially the second, had been the most tremendous success.

The tendency of the domestic load to fall is causing a good deal of anxiety to the gas industry generally and the North Western Board in particular. Any increase in sales over the last few years has been the result of greatly increased interest being taken in gas for industrial furnaces and space heating in factories. Though this load may be increasing it is very competitive indeed, especially with oil and electricity, and it is often hard for the industrial gas engineer to make out a sufficiently strong case for gas on its merits alone whatever the price. This means that gas must be manufactured more cheaply. Mr. Welman stressed the point that his Board were continually on the look-out for new processes, especially those which could make use of the cheapest types of coal, since here was an advantage over gas production enjoyed by the electrical industry at their generating stations. The Board were now building an experimental plant to make gas by hydrogenation. At first oil would be the raw material but as soon as possible this would be dispensed with and coal substituted.

After our manpower and inventiveness, coal is our most priceless asset on which our economy in the past was founded, but with the expansion of industry outstripping our coal production and the shortage of sized coal caused by mechanical mining, it has had to give way to oil in power production. The Board are confident that coal is still the right raw material for gas making and has not succumbed to high level persuasion to erect oil gasification plants.

Such luncheons should be encouraged, not only gastronomically but also because they show the gas industry to the lay public. So many people have only a vague idea what the industry is doing and what problems face it. The general public tend to look upon it, because it is nationalised, as some special branch of Whitehall which is under no obligation to pay its way and therefore does not apply the rules and methods of modern industrial management, and for that reason is continually putting up its prices. What could be further from the truth?

The New Zealand Controversy

CONTROVERSY, it may be remembered, has tended to rage in the columns of the 'GAS JOURNAL' since the beginning of the year over the state of the New Zealand gas industry. In January, and again the following month, we commented on the tour of investigation which Mr. J. T. Haynes had been invited to carry out, on the latter occasion giving details of his findings—this under the heading, 'Mr. Haynes Hits Out.' A few weeks later, in March, we received and published an indignant letter from the General Manager and Secretary of the Auckland Gas Co., Ltd., Mr. Rupert Worley, hotly denying that the New Zealand gas industry had 'thrown in its hand'—a disclaimer also made by the Chairman of the Gas Association of New Zealand, Mr. D. H. Chrisp, and, indeed, included in our report on Mr. Haynes's findings. In the circumstances a few relevant figures published by the New Zealand Department of Statistics and reproduced in *Live Lines*, official organ of the Electrical Supply Authorities' Association of New Zealand, might prove illuminating—and provoke still further controversy.

Of 5,222 mill. cu. ft. of gas manufactured in New Zealand during 1955-56, 1,036 mill. cu.ft.—just under 20%—were lost in distribution. This represented an increased loss of 94 mill. cu.ft. over the previous year, while gas sold, at 4,152 mill. cu.ft., was 42 mill. cu.ft. less than in the previous year. Thus, while total gas manufactured was .9% more than in the previous year—to quote the official report—'owing to larger distribution losses the amount of gas reaching the consumer fell by 1%.' During the year, the number of consumers fell by 5,476, or 2.8%, while the average price of gas advanced from 12s. 8d. to 12s. 10d., these figures including a Government subsidy of 2s. per 1,000 cu.ft. of gas sold. Total revenue, at £3.5m., was £22,000 up on the previous year, but expenditure, at £3.5 mill., was £47,000 greater.

Well, there it is: We make no comment, we draw no conclusions; we merely publish the figures.

N.T.G.B. Documentary Films

THE North Thames Gas Board may be said to be starting a new kind of house magazine, in addition to the one they are already publishing each month. The new magazine consists of a series of documentary films of the activities of the Board, which can be booked by the departmental heads and shown to the employees in that department. By showing these films it will be possible for each section of the Board to be kept in touch with what another section may be doing or what developments are going on at the Board's manufacturing stations.

The set-up in the North Thames Board is somewhat different to the other area boards in that it covers the smallest area of any board but has the greatest output of gas, and therefore possesses the largest gas-making plants which must as far as possible be kept away from the centre of its area. The administrative departments on the other hand must of equal necessity be placed as near the centre of population as possible. It is possible therefore for the administrative and accounting staffs to be completely ignorant of how the chief commodity that the firm sells is made and distributed. A further point which is sometimes forgotten is that the type of community served by this Board is drawn from the extreme urban population of Metropolitan London, the suburbs, the rural parts to the west of the Board's area and Southend on the eastern boundary.

At the more remote parts of the area it might be somewhat easier to foster the community spirit among employees. Here many might want to meet at a weekly club night for dancing or on weekday evenings in the summer for playing tennis, or merely to meet their friends over a glass of beer any night of the week. The Board are in fact developing sports grounds and club amenities with this in mind, but such amenities must be made known among the employees, especially in the centre of London, which is well known for its independence on who knows whom.

So far the Board have made three 16-mm. sound films which run for about ten minutes each. The first film shows the visit of Sir Harold Smith and Sir Henry Jones to Beckton and other sections of the Board to inspect the development work being carried on. The second film gives an impression of the Schoolboys' Exhibition and the Gas in Industry Exhibition, at both of which the Board had stands, while the third was of more general interest. This shows the playing fields at Acton, the new river wall at Beckton, the new testing laboratory at the central stores, and the 'Cleanglow' plant at Ascot.

The Showroom Window

IN the vast majority of gas showrooms responsibility for what goes in the windows and how it is arranged rests with the showroom personnel, but it is seldom indeed that any member of the staff has received training in display. Obviously it is expecting a good deal of a salesman who has been trained only in gas utilisation and sales technique to produce something capable of competing with the work of skilled window dressers in other shops and stores. One answer is an area or divisional display department capable not only of providing large numbers of displays, but ensuring that they are properly used—a sort of police system. Admirable though this may be in principle it is usually far too costly. Credit must go to the South Eastern Gas Board for finding out whether that admirable institution, the College for the Distributive Trades, could do anything to help. As it happens they could and the result is the creation of an eight-day course in the fundamentals of window display which is being taken by 85 of the Board's divisional advertising assistants and showroom managers. The College, which, it will be remembered, co-operated with the gas industry some time ago in the creation of salesmanship courses, is responsible for training a very large number of students and personnel from many large stores in window dressing, and thus it was not difficult to devise a course in which the emphasis was on gas appliances. The course utilises the services of six instructors, each of whom specialises in some particular aspect of the subject—lighting, the use of showcards, display materials, etc.—and a certain amount of time is set aside for going out and looking at the work of first-class window dressers in the West End.

The showroom, and the showroom window in particular, is the first precious link with the consumer, the beginning of a chain which may lead to a sale, a demand for gas, and all that follows in its wake. Put another way, the showroom window is the public's peep-hole into the gas industry. What they see there may have a great effect on their whole opinion of gas. Unless we can keep pace in a competitive field which, as far as display is concerned, is growing more expert day by day, we stand to lose a substantial part of our new business.

It is appreciated that problems of distance and expense make it difficult for all other gas boards to follow the example set by the South Eastern. Nevertheless we feel this is an idea which several boards should investigate. It is interesting to note that although there are 600 people taking display instruction in the College, the South Eastern Gas Board is the only public utility to make use of these admirable facilities.

Personal Notes

MR. G. N. HODSON, of Hathernware Ltd., the retiring Chairman of the British Chemical Plant Manufacturers' Association, has been re-elected for a further year. The following are elected to the Council: MR. P. D. DOULTON (Matthew Hall & Co. Ltd.), MR. H. W. FENDER (Prodorite Ltd.), MR. E. S. FRANKLIN (Torrance & Sons Ltd.), MR. N. C. FRASER (W. J. Fraser & Co. Ltd.), DR. M. GUTER (Costain-John Brown Ltd.), DR. R. LESSING (Hydronyl Syndicate Ltd.), MR. G. W. RILEY (George Scott & Son (London) Ltd., MR. R. W. RUTHERFORD (Power-Gas Corporation Ltd.), MR. P. W. SELIGMAN (A.P.V. Co. Ltd.), and MR. R. F. STEWART (Dorr-Oliver Co. Ltd.). The Council has elected the following officers: Vice-Chairmen: MR. N. C. FRASER (W. J. Fraser & Co. Ltd.), MR. R. W. RUTHERFORD (Power-Gas Corporation Ltd.), and MR. P. W. SELIGMAN (A.P.V. Co. Ltd.). Hon. Treasurer: MR. MARK WYNDHAM (Bennett, Sons & Shears Ltd.).

MR. R. A. MATHER, General Manager, R. & J. Dempster, Limited, has retired after 37 years' service. Other retirements announced by the firm are: MR. C. H. DAVIDSON, Senior Sales Representative, after 40 years' service, and MR. H. JOYCE, Sales Representative, after 34 years' service. As a result of these retirements the following appointments have been made: MR. F. CONLEY is to be General Manager, MR. R. POLLARD is to be Technical and Sales Manager, and MR. R. NIEZGODA to be Research and Development Engineer. Mr. Davidson is continuing his services with the firm on a part-time basis.

MR. J. R. TAYLOR has been appointed by Kelvin & Hughes (Industrial), Ltd., as Area Engineer for the West of England. Mr. Taylor has served 18 years with the company, the last two as Area Engineer in South Wales. His new address will be: 'Garth,' Edward Road, Walton St. Mary, Clevedon, Somerset. Telephone Clevedon 3535.

MR. DAVID MUIR, Engineer and Manager of the Pontypridd undertaking and Deputy Chairman of the East Glamorgan Group of the Wales Gas Board, has retired after completing 51 years in the industry. Mr. Muir commenced his career with the Dunfermline Consumers Gas Company, and held positions with the Grantham, Grays and Tilbury, Tyldesley and Seaford undertakings before taking up his appointment at Pontypridd in 1920. Mr. Muir was President of the Wales and Monmouthshire Section of the Institution of Gas Engineers and a former Chairman of the Sales and Service Association. In addition to his duties at the gas undertaking, Mr. Muir was also a Captain in the Pontypridd Fire Service during the last war. Mr. Muir has been succeeded as Engineer and Manager by MR. L. GRAY, formerly of the Blackpool, Stratford-on-Avon, Neath and Swansea undertakings.

MR. DOUGLAS MELROSE, Principal Assistant (Organisation and Methods) with the Midlands Electricity Board, has been appointed Organisation and Methods Officer to the East Midlands Gas Board. He takes up his new appointment at Leicester on June 4.

MR. FELIX L. LEVY, Joint Managing Director of George Cohen Sons & Co., Ltd., has been elected President of the National Federation of Scrap Iron, Steel and Metal Merchants. Mr. Levy, who is also a Director of the George Cohen 600 Group, Ltd., was during the war Assistant Director of Scrap Supplies at the Ministry of Supply.

MR. HAROLD ANDREWS, Showroom Manager with the East Midlands Gas Board at Scunthorpe, has retired after 35 years' service.

I.G.U. Vocabulary and Statistics Committees

THE Vocabulary Committee of the International Gas Union met recently under the chairmanship of Mr. A. Lihrmann, General Secretary of the Association Technique de l'Industrie du Gaz en France.

The meeting was attended by the representatives of Belgium, France, Germany, Great Britain, Holland, Italy and Switzerland.

The Committee considered the progress made in preparing the vocabulary. It also reached a decision on the working method to be adopted for drafting the manuscript to be sent to the publisher. This manuscript will comprise some 1,500 terms more than originally anticipated. As decided at the previous meeting, it will consist of the vocabulary proper, a set of drawings, appendices featuring a limited number of definitions, tables of abbreviations, unit conversion tables and seven alphabetical indexes to cover the seven languages.

At a meeting of the International Committee on Statistics, Mr. R. Hönigschmid, Secretary of the Gas Committee of O.E.E.C., made a statement concerning the statistics drawn up by this organisation, and the Committee proceeded to a wide exchange of views on this subject. The draft yearly statistics drawn up by the Statistical Service of the Economic Commission for Europe of the United Nations in Geneva were examined.

The Committee drafted its report to the Cometec-Gaz concerning its study on statistics for unaccounted-for gas.

Diary

May 14-17.—THE INSTITUTION OF GAS ENGINEERS: 94th annual general meeting, Institution of Civil Engineers, Great George Street, London, S.W.1.

May 16.—THE COKE OVEN MANAGERS' ASSOCIATION, MIDLAND SECTION: Royal Victoria Hotel, Sheffield. 'The Clean Air Act, 1956, with Special Reference to Coking Plant,' Mr. G. E. Hall. 7 p.m.

May 18.—EAST OF SCOTLAND JUNIORS: Gas Showrooms, Kirkcaldy, A.G.M.

May 18.—WESTERN JUNIORS: Truro. Visit to Newham works.

May 22.—YORKSHIRE JUNIOR GAS ASSOCIATION: Joint meeting with the Manchester District Association. Visit to the works of the Lancashire Tar Distillers at Cadishead, 2 p.m. Tea, 4.30 p.m. Paper 'Some Inasinine Requirements,' C. Smettem.

May 23.—LONDON AND COUNTIES COKE SALES CIRCLE: Connaught Rooms, London, W.C.2. Annual meeting. 'Mechanical Handling of Solid Fuels at Merchants' Depôts,' Humphrey Warren. 2.15 p.m.

May 23-24.—SCOTTISH GAS BOARD: Perth. Staff Conference.

May 24-25.—BRITISH GAS STAFF ASSOCIATION: The Winter Gardens, Gloddaeth Street, Llandudno. Annual conference. 10 a.m.

May 25.—EASTERN JUNIORS: Beaumont Hall Hotel, Marine Parade West, Clacton. Annual General Meeting. 11.30 a.m.

May 25.—NORTHERN JUNIORS: Newcastle-upon-Tyne. 'Bacterial Infection of Oxide used on Gas Purification,' B. Richardson. 2.30 p.m.

May 27.—WEST MIDLANDS G.C.C.: Education Department, Council House, Margaret Street, Birmingham 3. 2.30 p.m.

May 28.—LONDON AND SOUTHERN SECTION, I.G.E.: Connaught Rooms, London, W.C.2. Spring meeting and luncheon.

May 29.—SOUTH WESTERN SECTION, I.G.E.: 'Further Thoughts on An Approach to the Use of Oil Gas in an Integrated System,' L. P. Ingram. Preceded by a visit to Gloucester Manufacturing Station.

May 29.—INSTITUTE OF FUEL: Institution of Civil Engineers, Great George Street, London, S.W.1. 'Some Fuel Developments in the U.S.A.,' F. F. Ross. 5.30 p.m.

The annual conference of the Association of Public Lighting Engineers is to be held this year at Torquay, from September 17 to 20.

Scottish Gas Board area Manager in Fraserburgh, Mr. R. R. Barrack, talked to fellow members of the local Rotary Club about the terms of the Clean Air Act.

More Coke Oven and Oil Refinery Gas Bought

SALES TO INDUSTRY, COMMERCE AND HOME CONTINUE RECENT TRENDS

TOTAL gas available in the nine months ended December, 1956, increased by 1% over the corresponding nine months of 1955. Gas purchased from coke ovens and oil refineries increased by 13% and the production of coal gas by about ½%. There was a decrease of more than 6% in the make of water gas.

Both industrial and commercial sales increased by 2%, but domestic sales decreased by less than ½%, total sales being about ½% higher.

Coke Production Up

Sales of gas appliances were again lower than in the previous year, cookers and water heaters showing decreases of 13% and 10% respectively. Sales of gas fires were reduced by 15%, of washing machines by 10% and of refrigerators by 46%.

Production of coke increased by under ½% and sales fell by 5%. Coke breeze production was almost 2½% up. The output of crude tar showed a gain of 1% while crude benzole production was 5% up.

Capital Plant

Total capacity of new plant brought into use for the nine months was nearly 77 mill. cu.ft. per day, an increase of 13 mill. cu.ft. over the corresponding period of 1955.

Between October and December the net increase in mains laid amounted to 492 miles, which brought the total mileage of new mains laid in the nine months ended 1956 to 1,602 miles. The corresponding nine months' figure for the previous year was 1,951 miles.

For the fourth year running, gas appliance manufacturers contributed in no small measure to the success of the annual London Press Club Ball, held this year at the Dorchester Hotel on May 3. The prizes have included cookers, sink water heaters, portable gas fires, boiling rings and playing cards. In the picture Mrs. Yvonne Stepler of Finchley is presented with a token to be exchanged for an Envoy Gas Cooker presented by Sydney Flavel & Co., Ltd., by Mr. Thomas McArthur, Chairman of the Press Club.

APV Receive French Research Men

Twelve leading French research workers visited the research and development laboratories of the APV Company at Crawley, Sussex, on April 29. They are on a tour of British research institutions organised by D.S.I.R. in conjunction with the British Council.

The party is led by M. Cheradame, President of the French National Association of Technical Research.

Mr. G. A. Dummett, Research Director of the Company, conducted the party round the APV laboratories and works.

Drama Society's Success

A FIRST-CLASS study by Frank Edwards of a young man's mental confusion when he discovers that his father had been a convicted murderer, brought realism to the Wynyard Browne play 'A Question of Fact' produced by the Gas Council Dramatic Society last week.

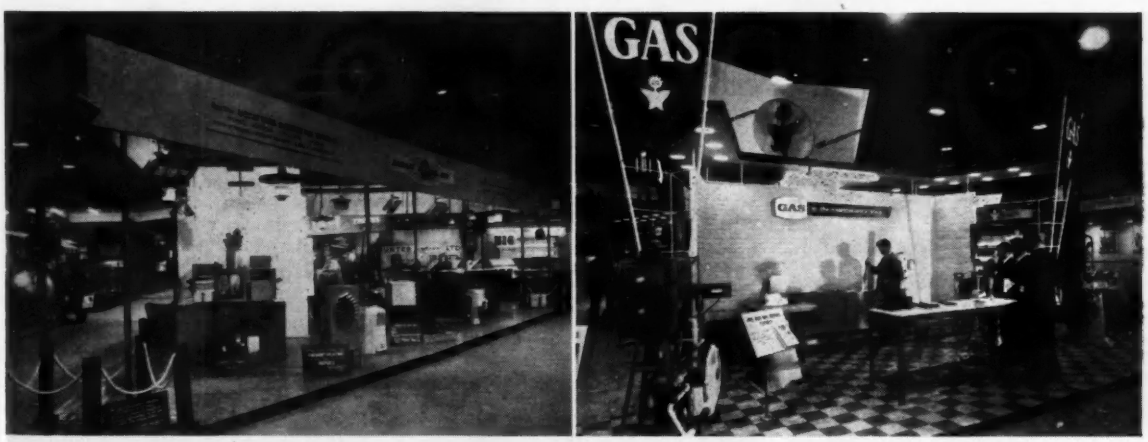
Light relief was provided by Denis Scott Wilson, and Winifred Fraser, as the young man's wife, Peggy Clarke, Ronald Herberte, Marjory Philbrick, Gwen Bundy, and Majorie Milne all gave satisfying performances.

Producer Tommy Cook can congratulate himself that in tackling their most difficult piece so far, the Society played better than ever.

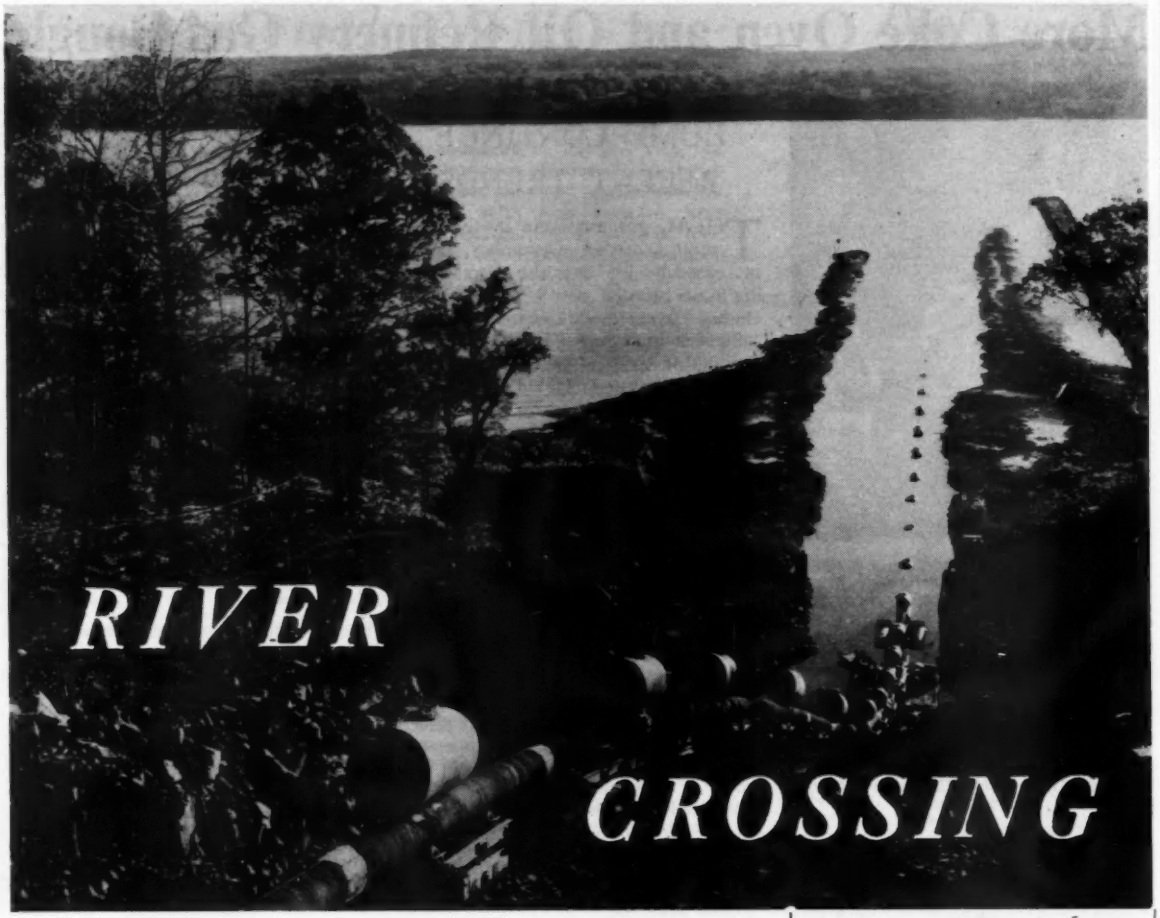
ABOUT TIME . . .

WHAT do long-service employees like to take away with them when they retire? Nearly always, apparently, a timepiece.

Nineteen men and three women, due for awards from the Scottish Gas Board, were offered a choice of one out of 12 gifts—13 chose wristlet watches, three asked for grandmother clocks, another three for chiming clocks, and three for wireless sets.



The picture on the left is of the Radiant Heating Limited stand at the Factory Equipment Exhibition, Earls Court (April 29-May 4). This stand was designed by Sales Director Mr. C. A. Lewis. The picture on the right shows part of the Gas Council stand. A skilled tool repairer is working in the fully-equipped maintenance workshop.



The pipeline string is poised on the west bank of the Hudson River, ready for the pull into the 7,084-ft. trench 25 ft. below the river bottom. The concrete-coated 24-in. twin-lines have a deadweight-total of approximately 2,000 tons, which was reduced to a negligible weight during the pull by the pontoons shown here. (Photos, courtesy Tennessee Gas Transmission Company and Bechtel Corporation.)

Hudson Pipeline Laid in 12 days Without Interrupting the Traffic

FROM OUR AMERICAN CORRESPONDENT

RIVER crossings are not at all unusual in the gas industry but the Hudson River presented some rather well defined obstacles as a 7,000-ft. path for twin 24-in. pipelines was contemplated. All work had to be done without interrupting the heavy river traffic which includes vessels from distant lands going as far north as Albany, 150 miles from New York Harbour.

THE VITAL GRIP . . .

Close view of the holdback collar that maintained tension on the pipeline as successive strings, 875 ft. long were welded, X-rayed and coated.

That type of traffic implied another problem: Getting the pipelines down into a ditch where they would be safe from dropped anchors. One experience in New York Bay taught that lesson well.

The crossing was complicated further by a drop of 150 ft. in the 1.000 ft. of immediate approach to the river's west bank. So, the usual rough-and-tumble routine of pipelining at high speed had to pause for special planning and preparation.

This river crossing for Tennessee Gas Transmission Company, about 20 miles north of the United Nations' buildings, is part of a multi-project reinforcement of the gas supply to Metropolitan New York and New England. In its entirety, this Tennessee expansion project included 250 quite ordinary miles of construction, but 1.75 miles of somewhat new engineering drama.

After many months of pre-construction engineering, this was the job to be done: Drop 150 ft. off the west-bank Palisades . . . cut a trench, 50 ft. wide, 7,084 ft. long, not less than 25 ft. below the river bottom . . . cut through an old stone dock . . . raise a sunken concrete barge, 135 ft. long and 25 ft. wide, and dispose of it . . . dispose of 800,000 cu. yd. of stone and soil removed from the trench . . . lay the twin 24-in. lines, weighing 525 lb. per lineal foot.

1,200 Tons of Pipe

There is scant dignity for the job done by Bechtel Corporation in such simplification, but the character of the planning is indicated by the completion of the crossing 12 days after it was started.

A staging area was created atop the

Palisades, 200 ft. above the river level and in line with the crossing route. Here, 1,200 tons of pipe were received from the mill in lengths of 35 to 45 ft. The seamless cold-expanded line pipe, 24 in. outside diameter and wall thickness of ½ in., has a minimum yield of 52,000 lb. per sq. in. Individual lengths of the pipe were coated with coal tar and wrapped with glass fibre, glass felt, enamel and asbestos felt. Then, for both weight and protection, it was further coated with 3½ in. of ilmenite aggregated concrete. Total weight was then 525 lb. per ft. of length.

Pneumatic Rollers

When the concrete coating had cured, the pipe lengths were weighed and numbered, and brought close to the ramp leading down to the river's edge.

Welding crews took over at that point, still on top of the Palisades, to assemble 16 strings, each 875 ft. long. All joints were X-rayed and each string was tested hydrostatically to 1,200 lb. per sq. in. After approval, the joints were coated and concreted. The 16 strings were ready for the crossing.

The trip to the river's edge was down a 600-ft., 25-degree ramp, made of a series of stationary pneumatic rollers with rubber tyres angled to hold the pipe steady and to prevent damage to either the coating or the pipe itself. The pipe bends on the ramp had a minimum radius of about 1,200 ft. There was very little cracking of concrete during the entire operation; none of the cracking was of a serious nature.

Work at and under the river was fully co-ordinated. The heavy sunken barge was raised and towed downstream, through New York Harbour and well out into the Atlantic where it was resunk to remain, presumably, for all of time. The old stone dock, reminder of a very much earlier and different transportation dream, was to be used as fill for the trench after the lines were laid.

The staging area where all preparations for the Hudson crossing were made. Here, another string is being brought into position for welding to the line during the pulling operation.

The original condition of the side of the Palisades was not suitable for the ramp, so a deep cut, 960 ft. long, was necessary.

Disposal Problems

Economic disposal of the material dredged up from the trench remained a problem. True, it could be taken out to the Atlantic and dumped, but the cost would be heavy. Finally, by arrangement with a willing owner, a large old claypit adjacent to an abandoned brickyard on the river's edge became the disposal point for the 800,000 cu. yd. Incidentally, the pit area was reclaimed, as a direct result, for useful purposes.

This was not to be a free-pull of the pipe string, so a holdback winch was anchored in a base cast from more than 100 cu. yd. of concrete, 900 ft. west of the river, up on the Palisades. A pulling winch was set similarly on the east bank. Dynamometer readings, during the crossing, showed an average tension of about 65,000 lb.

As each of the 875-ft. strings of pipe was put on the ramp rollers, pontoons were lashed on at 63-ft. intervals. They reduced the negative buoyancy of the pipe from 525 lb. per ft. of length to 25 lb. Each pontoon was equipped with a releasing mechanism which when actuated would cut the three pairs of double lashing bands, 2 in. high-tensile banding steel, after the line had been pulled across the river in its trench.

Four sideboom tractors held and steadied the pipe strings as they moved down the cut in the Palisades to the river. They were an added precaution against misadventure, despite the holdback winch and the pneumatic rollers.

A double 1¼-in. steel pulling cable, reaved through a buoyant roller bearing block, was laid across the river to pull the lead end of the pipeline. Another cable, shorter but with the same strength, reached from the holdback winch to the west bank.

The barge with the pivoted launching ramp allowed pulling to proceed without regard for the tide.

Concrete Coated

When the actual crossing operations were started, they continued round-the-clock. As the tail-end of a pipe string was about to clear the top of the roller ramp, the next string was moved on the level part of the ramp for joining. A holdback collar was applied to the end of the first string and tension was built up. The next string was welded to the first, the weld X-rayed; the joint was concrete-coated and cured. Then the pulling continued. Each of these tie-ins required about five hours.

Every moment of submarine activity required close co-ordination between the

(*Continued on p. 328*)

IRISH GAS ASSOCIATION AT WEXFORD

PROBLEMS FOR GAS IN IRELAND

President Urges Investment for Efficiency

THE quality of enjoyment and good fellowship which has always been a feature of the activities of the Irish Gas Association was well to the fore on May 8 and 9 when the Annual General Meeting was held at Wexford under the Presidency of Mr. J. K. Cantwell, General Manager and Secretary of the Wexford Gas Consumers' Co., Ltd.

The meeting took place at the Talbot Hotel where, on Wednesday, members were welcomed by the Mayor, Councillor Edward Hall, and Dr. T. E. Pierse, Chairman of the Wexford Company. The latter described briefly this 'historic and quaint old town' in which was to be found Norwegian, Danish, Spanish and Norman blood. Dr. Pierse referred also to the gas undertaking which, like a certain London theatre, never closed during the war—'we always had a glimmer!' The company had had its difficulties, he said, but during his comparatively brief stay there Mr. Cantwell had done 'a marvellous job of work' as a result of which the undertaking today was flourishing.

Sombre Possibilities

The difficulties to be overcome by such an undertaking as Wexford in order to flourish were clearly described in the Presidential Address. Indeed, Mr. Cantwell said that, looking back on his short tenure of office as Manager of the Company, he felt confident that few, if any, of his predecessors in office had had to review a period replete with so much stress and to speculate on a future more fraught with difficulties and sombre possibilities. The most important and vital factor was coal supplies, and here was found their chief cause for apprehension. During the year changes in British policy designed to terminate coal export obligations, except by quota to Denmark and Ireland, had had no detrimental effect. The agreed quotas, while leaving little if any margin over use, had been forthcoming promptly and the qualities had been satisfactory. Out of the question of price, however, there arose their particular concern for increases over the last 18 months which equalled no less than 42s. per ton and, with freights, brought prices to about double those met by British gasworks.

With such enormous additions immediately past, it might well have been anticipated that they could at least look forward to a respite from new demands. Regrettably, however, world prices for European imports to Europe, which governed the prices they paid, had been much affected by the Suez crises and, in consequence, further increases had taken place in the last six months in British export prices. Due to the terms and period of their contract they had so far avoided these most recent changes; such rises were, however, unpropitious precedents for discussions now about to commence on the renewal contract terms. However, the influence of a mild winter and the re-opening of the Suez Canal had contributed towards a falling freight market in recent weeks which at least offered hope of a more favourable trend.

The present prices for coal in the Republic of Ireland were equivalent to an increase of eight to nine times the pre-war level and the consequent increases rendered necessary in the price of gas and coke had impaired the competitive power of the industry. The burden weighed heavily on all undertakings, particularly on smaller units where the populations served were in general less able to meet increased costs, and the law of diminishing returns was demonstrated in sales. In their present position a prospect of increased prices must be viewed as of the utmost seriousness and would be resisted by every means available to the Association. In connection with the last coal price increase since June last of 27s. per ton they, together with other national coal importing interests, had exerted maximum pressure on the National Coal Board for abatement, which was re-inforced by the support of the Minister for Industry and Commerce. The demands of the National Coal Board, based as they were on their own problems and tremendous difficulties, were strongly pressed and the concessions secured from the original proposals had proved very limited. In addition to this paramount threat to the industry of stringent coal supplies and advancing prices, they had with industry generally the common problems arising out of inflation and international events unfavourable to settled operating conditions.

Wage Increases

Labour demands, strikes and the threatened use of strike action were a feature of the times, and while the pressure of higher living costs was a real grievance of labour, and indeed of the private individual, the solution to these difficulties in the gas industry, hard pressed to keep its prices at reasonable and competitive levels, added considerably to their responsibilities. During the year the full impact was felt of what in Southern Ireland was the 'fifth round' increase in post-war wages, and throughout the industry this had added approximately 1d. per therm to the cost of gas. Petroleum oils for gasmaking, including both the middle distillates used for carburetted water gas manufacture and heavy residual oil which had been receiving attention in the Irish gas industry in connection with the total oil cracking plant development, had been subject to heavy price increases during the year. In May last the Irish Government, as part of its policy of raising additional revenue to meet the adverse payments balance, had imposed a duty of 1d. per gal. for the first time in the State's history on all heating oils, and in the autumn events in the Middle East, together with the closing of the Suez Canal, had resulted in the oil companies placing an addition of 6d. per gal. on these heavier grades of oil. These items, totalling 7d. per gal., had represented a combined increase of up to 50% on the then ruling costs and had caused those in the Irish gas industry whose thoughts were turning increasingly towards oil gasification as a remedy for high coal prices, to reconsider the prospects. It was clear that if the higher price for oil products continued the advantages of the new catalytic cracking processes would be greatly lessened.

Turf for Gas-making

In their search for a cheaper therm than coal carbonisation they had canvassed all possible alternatives. They had been especially interested in any development which might further the use of turf for gas making for, while gas coal must be imported, turf was indigenous and would eliminate the insecurity of supply which was recurrent with coal and oil as each international crisis occurred. During the war years determined attempts to use turf in conventional coal gas retorts had been unsuccessful both technically and economically. Since then promising processes in Sweden based on the pre-drying of turf and total gasification of turf briquettes in oxygen under pressure by the Lurgi process had proved unacceptable due principally to high cost, and it would seem that there was at present no prospect in the development of turf utilisation which was likely to bring financial relief to the Irish gas industry.

Of other alternatives the establishment of the projected oil refinery in the Cork area offered the prospect of liquid petroleum gas by-products available for bulk transport by road or rail. It might well be that butane and propane air dilution processes which were low in capital cost based on such supplies would offer a welcome alternative to high cost coal, at least for smaller works, and this was a prospect they were watching with more than ordinary interest.

In the economics of carbonisation as distinct from gasification a factor of major importance was the strength of the coke market, and it might be postulated that if carbonisation was to remain in favour for gas making an assured market for the coke produced for sale was

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necessary, and the price relationship to coal costs must be favourable. In Southern Ireland recent rises in coal costs had been steep and it had been necessary to give ground on the coke/coal price relationship to enable disposal. The incidence of a mild winter immediately past had no doubt been a contributory factor but not an important one, and there were grounds for feeling that the trend of demand contained a weakness which must be reckoned in consideration of future plant policy.

Consumer Resistance

The demand for coke in Ireland, as compared with Great Britain, had been unfavourable and might be attributable to the high prices which must be charged. The price of both coal and coke had reached a point at which general consumer resistance had been created and maximum economy was being observed. Indigenous machine-won turf, turf briquettes, and fuel oil had in recent years greatly improved their relative price relationship to coal and coke, and were a not inconsiderable factor in the situation. Finally, imports—mainly from Great Britain—of low volatile fuel and gas coke, although limited in quantity, were available at prices below the price of coal into Irish gasworks, and had a nuisance value out of proportion to their quantity.

A most important matter which arose in consideration of modernisation and re-equipment of the industry, was that of providing the finance. Most undertakings in Ireland were small and had little, if any, surplus revenue available for modernisation, and new capital would be difficult to raise. In the strenuous post-war period resources everywhere had been fully taxed, and it was his view that today substantial finance for renewal or capital requirements could not be found within the industry. He believed that, at least among the smaller units, an appraisal of lower costs through modernisation would support such investments as commercially sound and would bring benefits by way of lower charges for gas.

It was the strongly expressed desire of their Government to build up the strength and industry of small towns and village life to offset the evil of forced emigration, and provide local employment. This matter was one for individual undertakings to assess their requirements, but where cases for capital assistance existed it was his view that their Association was well placed and the proper medium through which collective representations should be made to the Government.

It was with some reluctance that he felt impelled to place on record a criticism of the State Electricity Supply Board's advertising policy, and to refute certain claims which were not warranted by the facts. His objection lay principally in the view that a semi-state concern had a duty to avoid the possible prejudice by unproved and highly contentious claims that cooking by electricity was the most efficient, and the inference that all other methods of cooking created fumes and dirt and were less reliable and more expensive. While this was not the place to deal in detail with these claims and implications which, to be true, must cover depreciation and maintenance charges as well as the cost of fuel, they were able to say that, based on tests and cost evaluations, the average cooking by gas in this country was the most economical of all methods, and cost the housewife less per meal than any other. Thus they claimed that it was gas, and only gas, which was the cheapest, fastest, and most efficient of available fuels, and there could be no challenge to the fact that in variety and price gas cookers were unequalled. In the areas they served the housewives' overwhelming choice was clearly gas for cooking and any contrary inference created was not justified and was misleading.

They faced a future much more competitive than ever before, which allowed of no easy optimism or complacency. Service was the key to the consumer's goodwill and with hard work and efficiency he had no doubt that their industry in Ireland would meet whatever challenge the future held.

Negotiations with the N.C.B.

At the conclusion of his address Mr. Cantwell received the President's medal from the hands of the last holder of that office, Mr. J. Lusted (Strabane).

Presenting the report of the Council and an abstract of the accounts and auditor's report, Mr. N. J. Robertson (Dublin), the Hon. Director-General of the Association, said that the total membership was now 146, an increase of six on last year. He reported the fact that negotiations had taken place during the year with the National Coal Board covering prices, quotas, and qualities, and that negotiations for the 1957-58 contract had been commenced with the indication of a further advance in prices being demanded. A scheme with the purpose of co-operatively countering the Electricity Supply Board's advertising and propaganda had been discussed with gas undertakings and the major appliance supply firms, and agreement in principle had been secured. Due to the Suez crisis, possible effects on fuel availability, and negotiations with the Electricity Supply Board to avoid mutually damaging statements and claims, the scheme had not yet commenced. A proposal to hold more frequent technical discussions in local centres was under examination.

The business meeting concluded with the presentation of a paper by Messrs. A. F. Cottrell and T. W. Austen, respectively Deputy Chief Operating Engineer and a member of the Design Department, Woodall-Duckham Construction Co., Ltd. The paper, 'Efficiency and Economics of Coal Carbonisation,' will shortly be published in the 'GAS JOURNAL.'

Following luncheon, held at the invitation of the Wexford Company, members and their ladies travelled by coach to Johnstown Castle in the grounds of which had been established an agricultural research establishment. The party was joined by Sir Henry Jones, President of the Institution of Gas Engineers and Deputy Chairman of the Gas Council, who was to be one of the principal guests at the Association's Annual Dinner, held the same evening. Traditionally an opportunity for eloquence, this event proved to be no exception to the rule. Five toasts and nine speeches, which conspired to prolong the festivities into the early hours of May 9, in no way exhausted the company.

Offer of Help

The President having proposed the toast 'Ireland', 'The Irish Gas Industry and the Irish Gas Association' was proposed by Mr. G. Bartley, Parliamentary Secretary to the Minister for industry and Commerce. Referring to the unobtrusive and satisfactory service given by gas he commented particularly on the fact that the industry had not foisted its difficulties on the Government. The price and the causes of variation in the imported coal used by the industry was of course something over which the Irish Government had no control. 'Nevertheless, in so far as the Minister's offices may prevail, they will be very readily placed at the disposal of the Irish Gas Association and the Irish Gas industry.'

Responding, Mr. Robertson said that in view of the apprehension with which they regarded the future and the serious difficulties which needed to be overcome, Mr. Bartley's invitation greeted their ears with delight—here indeed was a valuable offer of help.

Major G. Anderson (Waterford and Kilkenny) proposed the toast 'Our Guests and Kindred Associations,' to which Sir Henry Jones replied. Having conveyed the greetings and good wishes of the Institution and complimented Mr. Cantwell on his address, Sir Henry said that from what he could see, the problems experienced by the gas industry in Ireland were much the same as in Great Britain, only more so. In Britain they were looking for and developing new processes, particularly in the gasification of oil. He dealt briefly with the implications of the Clean Air Act and the economics of gas and coke production.

Mr. T. McDougall (Londonderry) Vice-President of the Association, proposed 'The Borough of Wexford and the Wexford Gas Company' to which the Mayor and Dr. Pierse replied. 'The Press and the Ladies,' proposed by Mr. F. K. Thomas, was responded to by Mr. G. W. Battison, Editor of the 'GAS JOURNAL.'

ARCHITECTS' JOURNAL GAS SUPPLEMENT

The Architects' Journal for April 25 contained the second of a series of supplements sponsored by the Gas Council giving a full technical description for architects of the different uses to which gas and coke can be put. Five hundred copies were distributed among the area boards, plus 10,000 reprints.

A further 10,000 reprints are being set aside and when the whole series has been completed, these will be bound and issued to the area boards for presentation to the architectural profession.

Wales and Mon. Section Spring Meeting

Papers Dealt With Peak Demand and Distribution Development

THE Wales and Monmouthshire District Section of the Institution of Gas Engineers held their Spring Meeting at Tenby under the Chairmanship of Mr. A. H. Dyer (Newport).

Mr. Dyer, in his Chairman's Address, described the Newport undertaking's development. Two papers were read, one by Mr. W. E. Whitney, entitled 'The Renovation of Works Plant to Meet Peak Demand,' and the other by Mr. A. Pickard, 'Preparation of a Distribution Development Report—Swansea.' These papers will be dealt with in later issues.

Panels and Committees

Following the official luncheon, Mr. E. M. Edwards proposed the toast to the District Section and apologised for the absence of the President, Sir Henry Jones, and Dr. Burns, Senior Vice-President. Members, he went on, were perhaps not familiar with the many panels and committees which worked during the year on such subjects as codes of practice, safety rules, gasworks effluents and gas distribution. The Institution was also playing an important part in international affairs throughout the world. Prior to the war, and immediately succeeding it, the Institution took a very active part in developing the International Gas Union through which the interchange of experience was a great benefit to all.

Real Strength

But the real strength of the Institution lay in the District Sections. If they were strong and virile so would the Institution be strong and virile.

The Sections had an important part to play in educational matters, and the Institution viewed the educational scheme as one of its prime responsibilities. It was a great encouragement to note the successes of their younger men.

Relating some of the history of the Section, which was formed in 1905, Mr. Edwards said the field covered by papers was very wide indeed and showed that many of the problems of today were not new.

Views of the Public

In 1912, Mr. W. Clarke Jackson wrote, 'Gas sales depend to a very large extent upon the views of the public towards gas generally, its usefulness, cheapness and convenience as an agent of light and heat in the house, or light, heat and power in the business, as compared with any other agent or combination of agents, capable of answering the same purpose. This is a most important fact to recognise, as by doing so one is at once impressed by the great necessity of getting at the public, in order to lay these factors—usefulness, cheapness, convenience—very clearly before them.

'This, I think, can only be done thoroughly by combining advertising with canvassing; the advertisement paving the way for the canvasser, who can, the more easily, clinch orders where ground has been broken in this manner.' That was written 45 years ago, and was a truth which still stood.

'Many of the basic problems were arising 30 or 40 years ago,' Mr. Edwards added. 'The achievements of this District Section in the past have been very great. The work that is being done at the moment is most encouraging for the future, and I believe that the gas industry has a very great future. There are great developments only just around the corner and we need not fear any talk of development of nuclear energy. I think the time will come when modern energy will be a development of our own business and not a competitor against it.'

Great Honour

In his response, the Chairman, Mr. A. H. Dyer, referred to the very great honour paid to the Association in the choice of Mr. E. M. Edwards as Junior Vice-President of the Institution. He thanked the Chairman of the Wales Gas Board, Mr. T. Mervyn Jones, for his presence and for the interest which he and the Board took in the Association.

The success of the industry depended largely on the knowledge imparted by members of the Institution. They were meeting competition from various other forms of fuel, and it was only by having the brain power and ability to meet that competition that they were going to hold their own in an industry in which most of them had the greatest faith possible and which would not only survive, but increase from strength to strength.

'There is nothing like gas as a means of heat and fuel and we must all have faith in that,' added Mr. Dyer. 'We must believe in it as a religion, and if we have the right kind of personnel, there is no reason why we should not go on for another 30 years or for 330 years.'

Dr. A. B. Badger, Industrial Relations Officer, Gas Council, before proposing the toast 'The Prosperity of Tenby,' asked members and guests to stand in memory of the late Dr. Foxwell whom he described as 'a very great friend to the industry.'

Vast Opportunities

The Mayor of Tenby (Alderman P. R. Howells) responded to the toast and pointed out that there would be vast opportunities for the gas and other industries in Pembrokeshire, when the proposed new oil base was established.

Mr. I. W. Thomas, Senior Vice-Chairman of the Wales and Mon. Section, proposed the toast to the guests, and Mr. J. R. W. Alexander, in his response, said he was interested in the suggestion of examinations for the gas engineer.

Administrative Knowledge

'In large scale industry,' he said, 'few technicans can succeed today without managerial or administrative knowledge. If a man in this business cannot hope to be advanced to a higher post, and if it can be said the technical syllabus is already too long, I ask why not shorten it or in the alternative, make management and administration a post graduate course.'

'The emphasis in education today is overmuch on science, but it is increasingly realised that this should be coupled with some knowledge of the humanities and the arts.'

Sport at Tenby

THE Spring Meeting of the Wales and Monmouthshire Section of the Institution was held in delightful weather. The first day was fully occupied by golf and bowls competitions. In the former the Upjohn Cup was won by J. B. Clay (19) with a return of 73; the runners-up being Darrell Rees (2) and A. Jones (24) with 74. In the foursomes, the Dean Cup went to A. Pickard and R. J. Winsor, who returned 79.

On the bowling green, after very keen competition, the Holmes Hunt Bowl was won by Stanley Davies from Gordon Hogg. The trophies were presented by Mrs. Dyer in the course of a dance held in the evening at the Royal Gate House Hotel.

TECHNOLOGY AWARD COURSES

The following courses now in progress have been recognised as leading to the Diploma in Technology:

Birmingham College of Technology—Sandwich course: Metallurgy.

Wolverhampton and Staffordshire College of Technology—Sandwich course: Mechanical Engineering.

The Council have also approved the following new courses proposed by colleges:

Northern Polytechnic — Full-time course: Applied chemistry.

Northern Polytechnic — Sandwich courses: Applied chemistry; physics and technology of electronics.

Borough Polytechnic — Sandwich courses: Chemical technology; electrical engineering.

NEAR THING FOR SCOTTISH CONSULTATIVE COMMITTEE

Almost Disbanded in Reorganisation

THE South-West District Committee of the Scottish Gas Consultative Council had a narrow escape from disbandment during the Scottish Gas Board reorganisation, it was revealed at a luncheon held in Dumfries recently.

Ex-Provost Bell, Dumfries, who presided, said that there had been a slight change going on in the organisation of the gas industry in Scotland. There were five district committees of the Scottish Gas Consultative Council throughout Scotland; he had had the honour to be chairman of the South-West District Committee since its inception.

Decision to Retain

In January of this year it appeared as if the South-West Committee was going to disappear, since the Consultative Council had had under consideration the decision of the Scottish Board to dispense with the South-Western Division and to absorb the undertakings therein into the Edinburgh and South-Eastern and Glasgow and Western Divisions.

After consideration, however, it had been decided to retain the South-West District Committee, a decision that had been supported by Sir Robert Nimmo, Chairman of the Consultative Council.

Bailie J. Dunlop, Maybole, said that the South West District Committee might well have been disbanded had it not been for the efforts of ex-Provost Bell, who had put up a very strong case for its retention.

Local Management

Mr. H. R. Hart, General Manager of the Glasgow and Western Division of the Scottish Gas Board, said that one of the problems of a nationalised industry was in keeping contact with the people it sought to serve. It was through the medium of district committees such as theirs that effective contact with consumers could be made.

The Scottish Gas Board had sought to revive the institution of the independent undertaking, and to play their part in the community life of the district. The administrative heads relied on the good work of local management.

At a private meeting of the Committee, held prior to the luncheon, Mr. Hart explained the new organisation of the Scottish Gas Board.

Mr. A. B. Leitch, Edinburgh, Secretary of the Scottish Gas Consultative Council, and Mr. S. C. Johnstone, Dumfries, Sub-group Area Manager of the Scottish Gas Board, were also present.

Crossing the River Hudson

CONTINUED FROM P.321

crews on both sides of the river. The importance of instantaneous and reliable communications was emphasised. Two radio circuits were provided between the winches and the control tower on the west bank. Telephone circuits were available immediately, if radio failed. As additional protection, in case all voice circuits failed, a visual system of coloured flags and lanterns was planned and on hand.

The pulling moved at a maximum of 20 ft. per minute, with an average of 12 ft. during actual pulling operations. The downstream line was pulled first. After inspectors for Tennessee Gas Transmission Company, Bechtel Corporation and other contractors had verified the depth of the entire pipeline length with a special fathometer, the work was accepted. Then the releasing mechanism on each of the pontoons was actuated. The lashings were cut, the pontoons came to the surface and were recovered. Small buoys attached to the pontoons brought up the releasing mechanisms and their lines.

Within 24 hours after the first line had crossed, the winches on either side of the river had been moved 25 ft. upstream and the cable laying was under way for the second crossing.

With the completion of the second pull, the first trouble-free gas pipeline crossing of the Hudson was finished.

This project was conducted with high concern for public reaction and public relations. Great care was exercised in posting notices of impending work; local inconvenience was minimised; co-ordination with appropriate local authorities was maintained; surface damages were minimised; and restorations of the surface to near-original conditions were thoughtful and attractive. With some emphasis, this aspect of the project is in contrast with earlier gas pipelining in the same general area.

In Brief

STREET LAMPS CONVERSION SCHEME

A SCHEME to convert Hertford's street lamps from gas to electricity, prepared by the borough engineer and surveyor, Mr. W. A. Weeks, has been submitted to the borough council.

The first phase would cost £7,746 with annual running charges amounting to £5,803. This phase would involve main traffic routes only.

The Scottish Gas Board is to play a prominent part in this year's Scottish Week, which is being organised (September 2-7) by the Scottish Tourist Board.

The International Gastronomic Festival is to be held at Torquay from May 15-17. The Festival is organised in conjunction with the International Academy of Chefs de Cuisine and the South Western Gas Board.

'The plant engineer's ability to change' will be the theme of the tenth annual conference of the Incorporated Plant Engineers to be held at the Palace Hotel, Buxton, May 15-17.

Work has commenced on a £1,200,000 extension scheme at the Stockton-on-Tees works of the Power-Gas Corporation, Ltd., and its associated firm, Ashmore Benson Pease and Co., Ltd.

A 6½-ton Whitlock Dinkum Digger No. 1409, fitted with a hydraulic power shovel known as 'The Dozaloda,' has been stolen from a roadside site in London.

Its length is over 20 ft., and it is worth nearly £2,000.

MANCHESTER SECTION

In our report on p. 280 of last week's 'Journal' we erroneously said '... there was a visit to Pilkingtons glassworks.' This, in fact, should have referred to an announcement for the next Chairman's day following a lunch by invitation of the N.W.G.B.

MANUAL OF FLEXIBLE JOINTS FOR CAST IRON GAS MAINS

REFERENCE was made, on page 13 of the 17th Report of the Chairmen's Technical Committee of The Institution of Gas Engineers: 1955-56 (I.G.E. Communication No. 492), to the preparation of a *Manual of Flexible Joints for Cast Iron Gas Mains*, which would include the recommendations of the Institution in regard to these joints, together with full dimensional details and diagrams of the various types of joint available and the manufacturers' jointing instructions relating to them.

This manual which has been prepared by the Cast Iron Pressure Pipe Association, is now obtainable (2s. 6d., post free) from the Association, Crusader House, 14, Pall Mall, London, S.W.1.

EAST AND WEST MIDLANDS BOARDS CO-OPERATE TO PUT

Gas on Show in the 'Great Shop Window'

B.I.F. LUNCHEON HELD IN BIRMINGHAM

IN an uncertain world, one factor, as far as the gas industry is concerned, stands out with ever-increasing clarity: No matter how we may be threatened in the domestic field, our industrial load is on the increase and, being unique in providing clean flame subject to minute control, cannot, in the absence of quite dramatic developments in the use of other fuels, be surpassed or supplanted for a very wide range of industrial applications. For this reason, the British Industries Fair, providing, as it does, a unique opportunity for showing the world the latest developments in the industrial use of gas, assumes greater importance for the industry every year.

As Mr. G. le B. Diamond, C.B.E., Chairman of the West Midlands Gas Board, said at the B.I.F. luncheon at the Grand Hotel, Birmingham, on May 7, the gas industry has supported the Fair since it was first held, and, indeed, should support this 'great shop window' of British enterprise.

The gas industry stand at Castle Bromwich is the joint responsibility of the East and West Midlands Boards. The two Boards, Mr. Diamond went on, were autonomous trading units, but they worked together to the greater possible extent 'from the Chairman down to the individual officers.'

Continuous Development

Half the gas sold in the East and West Midlands was taken by industry, he continued, and the two Boards carried out continuous development for special purposes. And what they achieved was now on show for all to see at the Fair.

Very real progress was being made. An example which the Chairman instanced was the automatically controlled slot forge furnace developed by the East Midlands Board in which the efficiency had been raised from less than 5% in the original design to more than 20% in the third and final design.

The East Midlands Board supplied the second cheapest, and the West Midlands the third cheapest gas in the country, Mr. Diamond pointed out. Labour relations were excellent, and all modern scientific developments were used where applicable.

The Chairman then contrasted the size of the gas industry, with a capital investment of £484 mill., with that of I.C.I. with £300 mill., and went on to propose the toast to the guest of honour, Sir Peter Roberts, Bt., M.P., Master Cutler of Sheffield and Chairman of Newton Chambers & Co., Ltd.

Replying, Sir Peter said that though the Finance Bill was to be debated in the Commons that day, the Whips had agreed that his presence at this B.I.F. luncheon was more important than his attendance in the House.

His industry, he continued, had had 100 years' association with the gas industry and were great users of gas. Today they found gas engineers as keen and resourceful as ever. He congratulated the industry on the steps taken to attract the right type of engineer.

Sir Peter then spoke of the frustration which the gas industry had suffered as a result of Government restrictions on capital expenditure holding up development. Things had now taken a turn for the better, and he hoped the gas industry would be able to get back into its stride.

The gas industry, he continued, must keep pace with capital development taking place in the electricity industry and nuclear energy, and went on to refer to the recent prediction of the Deputy Chairman of the Gas Council, Sir Henry Jones, that nuclear power might be exploited for gas production.

No Limit

The gas industry, he said, was greatly aiding the steel industry of Sheffield and there was nothing the industry could not do if the Government permitted capital development. He congratulated the Boards on their energy and skill in providing means for the efficient use of gas and looked forward to new developments.

Among the guests, who numbered about 240, were Mr. E. Duncan Brown, Chief Engineer of the Austin Motor Co., Ltd.; Mr. H. Bull, Managing Director of Brown Bayley Steels, Ltd.; Mr. H. Ping, Sales Development Manager of Firth Vickers Stainless Steel, Ltd.; and Mr. A. B. Waring, Managing Director of Joseph Lucas, Ltd.

After the luncheon, the party were guests of the East and West Midlands Gas Boards at the Fair.

Those responsible for the planning of the gas industry stand brought off a master-stroke in deciding on a 'live' demonstration of East Midlands Gas Board Equipment for the preparation of neon tube components for this undoubtedly attracts considerable interest on the part of visitors and provides a very striking illustration of the efficiency —and, indeed, indispensible nature—of gas flame for this use.

Also a wise inclusion on the stand is a demonstration of glass cutting—no gas is used in this process, though gas was used in the manufacture of the glass—and of the Nordac, Ltd., submerged combustion plant, which, though far from new, never fails to attract attention.

But to return to really recent developments in the industrial applications of gases and there are some 3,000 processes which gas meets in the area—there is a new 'glory hole' of the type used in the glass industry for the manufacture of tableware, etc., developed by Mr. L. Walker, of the West Midlands Board, Industrial Department.

Following recent developments the unit has been fitted with a recuperator and pneumatically-operated door, both of which features effect an economy in gas consumption. The use of the recuperator provides pre-heated air at a temperature of approximately 200°C. The door is always in the closed position except when the operator is actually using the furnace and it is this feature which contributes the greatest saving in gas consumption.

As the operator has normally to use both hands in the execution of his work, the door has been arranged to be operated by a foot panel set in the floor. When the operator steps on this panel a switch, which controls a valve in the air supply line to the pneumatic cylinder, is closed. In normal industrial units this switch would also control a valve in the combustion air line, which would ensure that the gas rate dropped to the by-pass condition when the door was closed.

Automatic Timing Device

For the purpose of the exhibition, however, this arrangement has been slightly modified as it was desired to fit the unit with an automatic timing device which raises and lowers the door when the unit is not being demonstrated. It has, therefore, been necessary to control the solenoid valve in the combustion air line by means of a micro switch which is in turn operated by the position of the ram in the pneumatic cylinder. Again, merely for the purposes of the exhibition, this micro switch, together with a similar one placed adjacent to it, controls two illuminated panels in the cabinet, indicating the position of the door. In order to bring home to the observer the effect of the closed door, a flow indicator is also included in the cabinet, which indicates the maximum and minimum rates of flow.

The control cabinet includes a two-way switch which enables the unit to be either operated in the normal way or operated *via* the timing device. Of course, the control cabinet and most of the equipment contained therein are only required for the purposes of the exhibition and demonstration and actual units used in industry would be much simplified.

Specially developed for a firm which

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used producer gas, to enable them to convert to town gas, is a sectioned bale-out furnace, typical of many used in the aluminium casting industry and for general metal melting.

The refractories and construction employed can be seen clearly, and generous use is made of insulating refractories to afford a low thermal capacity and minimum heat loss. This ensures quick heating up and speedy response on re-melting, whilst the use of the air/gas proportioning type burner equipment shown in conjunction with automatic temperature controls promotes efficiency of control of the plant by the operatives, and consistent results and efficient operation in every day use.

Plastic Pellet Heater

Another new development is a plastic pellet heater developed in conjunction with a local plastics moulding firm and used for pre-heating plastic pellets prior to insertion in the mould. The pellets are placed on a rotating table which passes between two radiating panels, arranged to ensure uniform temperature throughout the pellet.

The design of the unit is an improvement on the existing convection type gas fired heaters used for this purpose, and the construction has been kept very simple so that very little maintenance will be required. When compared with the more elaborate electrical high frequency unit, the low capital cost and low maintenance costs applicable to this type of unit, should represent a considerable saving.

The gas rate for the apparatus is approximately 30 to 35 cu.ft. per hour, and the heating-up time is 30 minutes. The radiating plates are controlled at a temperature of approximately 375°F. Arrangements are being made for the manufacture of these units on a commercial basis.

Of interest both to industry and technical colleges is a new crucible melting furnace developed in collaboration with the Thermic Equipment & Engineering Co. Ltd.—a conventional high temperature melting furnace modified to incorporate a burner operating with reasonable quietness.

Used as Standard

The burner comprises a standard air blast injector system, operating with air at a pressure of 16 in. W.G. and used in conjunction with a perforated refractory nozzle. This is mounted at the entrance to a circular refractory tunnel arranged to fire tangentially into the furnace chamber. The gas consumption, with an air pressure of 16 in. W.G., is approximately 100 cu.ft. per hour.

The Thermic Equipment & Engineering Co. Ltd. are now using the arrangement as standard on this type of furnace.

A further example of appliances designed primarily for use in technical colleges is a solder melting pot.

The unit exhibited has been arranged to incorporate a temperature control element which ensures that the metal in the pot is held at a constant temperature. This is a very important and desirable feature when the pots are in use during an examination session and when the students have a limited time in which to complete their work. The unit also has many applications in light industry for soldering of components in production.

The temperature control element is manufactured by P.A.M. Ltd., Surrey, and operates on the expansion principle.

Also on show is a pipe bending hearth of a type for which there is a steady demand from industry generally and from technical colleges and training centres.

The unit has been provided with a special burner head designed to ensure the minimum of noise during operation, a feature which enables the hearth to be used without objection anywhere in a factory or in a lecture room during instruction.

When operating with air at a pressure of approximately 16 in. W.G., the hearth has a gas consumption of 450 cu.ft. per hour. On test it was found that the time required to heat a 1 in. B.S. pipe to a temperature of 850°C. was approximately 1½ minutes.

These are West Midlands Gas Board developments. To return to the East Midlands Board—and neon tubes—for a moment, when neon tube components are assembled it is necessary to have the electrodes, lead-in wires, and the interior surface of the glass clean prior to expulsion of the air, and the final sealing process.

Review of Industrial Developments

The cleaning process or 'bombarding' is done by passing a large current of electricity through the tube while it is being pumped free of air. During 'bombarding' operations a firm found that a black deposit appeared on the inner surface of the glass, and, as this occurred immediately before the tubes were sealed, the deposit could not be removed without spoiling the tubes. It was suspected that the electrodes were impregnated with oil from the presses during the several stages of forming, and attempts to eliminate the oil by chemical cleaning, also to contain it in the steel by electroplating, were only partially successful. As the problem clearly called for special treatment, it was passed to one of the industrial gas development centres for investigation.

Examination of the electrode material showed that it was almost pure iron or ferrite, containing less than 0·3% of other impurities including carbon. The output demand was 6,000 electrodes per day, to be treated in batches of 1,000-2,000 at a time.

Preliminary tests established that oily vapours were given off at about 300°C., but successful cleaning was achieved only at 800°C. in an atmosphere of hydrogen. As severe oxidation would occur if the electrodes were heated and cooled in the presence of air, it was decided to employ nitrogen instead of hydrogen, owing to explosive hazards with the latter. Even so, it was discovered that 'blueing' of the electrodes took place whenever the oxygen content of the bottled nitrogen approached 0.2%, therefore this trace of oxygen had to be removed in order to ensure continuity of successful cleaning.

The final plant consisted of a cleaning chamber, holding a retort containing 1,500 electrodes, an oxygen-removal unit, a flow meter for measuring the nitrogen rate and a bottle of compressed nitrogen. During the whole of the heating and cooling process a flow of oxygen-free nitrogen was passed through the batch of electrodes, and the resultant finish of the electrodes, was as bright and clean as when originally placed in the retort. No further trouble was experienced with these treated electrodes during either the 'bombarding' process or in their working life.

Slot Forge Furnace

There is also the slot forge furnace to which Mr. Diamond referred at the luncheon. Gasfired furnaces have been employed for many years in the cutlery industry for the heating of knife blanks prior to forging, reheating prior to drawing out the blades by rolling, tanging, and hardening. The majority of the furnaces are of the open slot type, the width of the slot varying from 12 in. to 48 in. dependent upon the type of work and the rate of production.

Various types of air blast burners have been employed, and control has usually been by hand adjustment of the gas and air cocks. When full-on, for initial heating of the furnaces, the air/gas mixtures may have been reasonably correct, but at lowered operational rates the adjustments have often been casual, with widely varying air/gas mixtures, mostly with excess air. This has resulted in heavy scaling and decarburisation.

Further, there has always been a tendency for operators to work the furnaces at temperatures in excess of those necessary for either the particular type of steel or the operation. The operator tends to fill the furnace with cold blanks, and wait until some of the blanks appear to be hot enough for working. In general, the result has been that the first 25% have not really been hot enough, the next 50% have been at the right temperature, and the remaining 25% burned or 'crozzled.'

Better Combustion Conditions

The first stage of development was to incorporate a better air/gas mixer, in relation to known burner nozzle areas. This gave better combustion conditions, but was still open to abuse owing to two-valve control. A marked improvement was made when a proprietary air/gas mixer was used having single valve control by means of a quadrant air cock. The results showed a gas saving of 30% for similar temperatures and outputs, together with a reduction in scale loss.

From the experience gained during tests a new design of reverberatory-fired slot forge furnace was evolved, which, in conjunction with the employment of high temperature insulating refractories and automatic temperature control

equipment, has shown the remarkable results mentioned by the West Midlands Chairman.

Another East Midlands exhibit concerns the preheating of refractory sleeves and plungers used in the glass industry.

Where semi-automatic machines are used for the mass production of glassware, the general practice is to melt the batch and cullet in large tank furnaces. After melting and clarifying, the molten glass flows through a number of feeders or refractory troughs to the machines.

At this stage, the glass, at 1,000°C., is fed through a refractory valve in carefully measured quantities, so that the minimum of 'flash' or waste glass remains after the articles have been fully formed. The valve consists essentially of a refractory sleeve holding the controlling refractory valve or plunger.

As each feeder is operating on a continuous basis, and erosion of the sleeve and plunger takes place in due course, this affects the flow rate of the glass, necessitating replacement of the valve and plunger under operating conditions. If cold refractories were placed directly into the molten glass, they would crack, owing to the thermal shock. It is, therefore, necessary to slowly preheat these to about 1,050°-1,100°C. before insertion, taking about five hours, and the Board's assistance was sought in designing a simple portable preheating unit.

This exhibit shows a typical preheating furnace consisting essentially of a casing lined with refractory, backed with insulation, and heated by a specially designed natural draught burner fed with air/gas mixture from a 1½ in. Aeromatic injector. The injector is rated at 100 cu.ft. per hour at a governed pressure of 2.5 in. W.G. A centrally disposed hole has been left in the centre of the burner to permit the insertion of a thermocouple for checking the temperature at the end of the plunger, should this be considered necessary.

For the localised heating of flat bars prior to bending or punching it is often necessary for a specific heating unit to be improvised for each application which should be both effective in operation and economic in capital cost. In a number of instances where localised heating only was required, i.e., the bending of round bars and the bending or punching of flat bars, several units were devised in conjunction with 'concentrated combustion' burners. The latter give high velocity flames of considerable intensity, enabling very rapid heating to be obtained. For example, if a piece of flat steel ⅜ in. thick by 1½ in. wide is placed on edge between two 'C.C.' burners, spaced 1½ in. apart, the metal will be heated to about 800°C. in one minute, and 1,100°C. in two minutes. In another case, a small 'D' shaped carborundum muffle was raised to a temperature of 1,350°C. from cold in seven minutes.

On show for such applications is a handy portable furnace initially designed to heat a flat bar in two places at the same time, to permit simultaneous bending in a jig. As a range of centres had to be covered, one pair of burners was fixed and the other pair left movable, providing a centres range of 12 in. to 30 in. This proved very effective in operation, and the portability of the unit was appreciated. On other occasions the furnace was employed for single point usage.

The 'C.C.' burners can be rated up to 150 cu.ft. of gas per hour per nozzle, when using air at a pressure of 28 in. W.G., and 100 cu.ft. per hour with air at 14 in. W.G., with a stable 'turn-down' consumption down to 15 cu.ft. of gas per hour.

January 1, 1956, was an important date in foundries, for on that day the 1953 Iron and Steel Foundries Regulations (Statutory Instruments, 1953) became operative in demanding that 'adequate' measures be taken to prevent fumes or other impurities entering into or remaining in the atmosphere of the workroom.

Many foundries have already installed highly efficient ladle heaters of the type shown on the stand, with the objects of ensuring cleaner shop conditions and precision operation, combined with fuel economy.

The correct air/gas mixture is obtained by using efficient equipment which can be pre-set for the appropriate type of flame. Once done, the correct conditions are automatically maintained whenever the equipment is used, operation being confined to manipulation of the air cock only against the rate of heating required.

Catering Equipment and Individual Exhibits

The foregoing covers the industrial section of the stand. There is also the catering equipment section in which, seen by the public for the first time since it went into production is the Aquafont Snackmaster, a complete snackbar back counter set of equipment comprising cooking, grilling, deep-fat frying, tea and coffee making and hotplate service. This unit is made up of five independent items, available separately or as a complete set mounted on a suitable stand which is also used for storage of cooking utensils. It is the first complete set of gas-fired back counter cookery equipment to be manufactured in this country.

Other exhibits in this section include Benham & Sons, Ltd., double deck pastry oven; Radiant Heating, Ltd., Grill-master; Radiation Group Sales double oven range and boiling table; the James Scott & Co., Ltd., deep fat frying unit; and the Coffee Master by Ewart & Son, Ltd.

Gas appliance manufacturers exhibiting on their own stands as distinct from the main gas industry display include **Harris Engineering Co., Ltd.,** who show their space heaters, including gas infrared radiants, gas units, and 'Wellsway' flued gas convector. Also seen here are Harris 'Trion' electronic air filters, including the new motorised moving washer system.

Not seen before, on this stand is the new Wellsway convector heater with thermostatic control, and a new 16-brick block infra-red radiant heater superseding the Harris two 8-brick block unit. A new development in these overhead heaters is single point suspension.

Parkinson & Cowan Industrial Products have on display a gas fired radiant heat tunnel and panel, drying and stoving equipment, conveyors, temperature indicators, Parkinson/Schwank high temperature industrial space and processing heaters, laboratory gas meters, and rotary gas meters.

Seen for the first time on this stand is the Model OD IL Parkinson-Schwank gas radiant space heater for outdoor restaurant and shop front use, of 12,500 B.Th.U. per hour rating. For large overhead units, this company have introduced the new Parkinson-Schwank electrical ignition, and flame failure device, enabling the appliance, no matter how high and inaccessible its fixing, to be switched on and off at will.

The display on the **Keith Blackman, Ltd.,** stand includes 'Tornado' centrifugal fans and blowers, ventilating and fume removal fans and dust units, as well as industrial gas heating appliances and controllers and governors.

Of special interest on this Company's stand is the new K.B. self-adjusting oil separator, seen in the gas display section, which is being shown for the first time. The 'Cupodel' hot blast cupola plant and 'Tornado' shot cleaning exhibits are also relatively new, while the Mark II 'Keno' unit marks a big advance in low resistance wet washing gear for trapping finely divided dust from air streams.

Among exhibitors well known to the gas industry are **A.P.V.-Paramount Ltd.,** manufacturers of stainless steel and and heat resisting steel castings; the **British Vacuum Cleaner & Engineering Co., Ltd.,** who are showing their industrial vacuum cleaners for the cleaning of factories, warehouses, and offices, and for flue dust removal, as well as their central vacuum cleaning installations, fans and blowers; while on the stand of **Robert Cort & Son, Ltd.,** is to be seen an array of their grading screens for coal, slurry, coke, stone, sand, gravel, ores, slag and chemicals, and examples of their gas valves.

Saml. Denison & Son, Ltd., have on show their testing machines, suspended weighers for crane hooks, and an example of the 'Blake—Denison' automatic totalising weigher and recorder,

applied to a belt conveyor. **George Ellison, Ltd.,** are showing electric switchgear, rotor and star-delta starters, and circuit breakers, and also hydraulic valves; while **Evered and Co. Ltd.** show a wide range of plastics, including Everex polytrim, Everex polythene tube and fittings, Everite plastics builders' hardware, Everine polystyrene wall tiles, Surreyware builders' hardware (metal) laboratory fittings, plumbers' brassfoundry, Silvertone door bells, and a Wilkinson fire alarm.

John Harper & Co., Ltd., display a selection of gas radiators, household scales, food mincers, grey and Meehanite iron castings, and examples of their numerous other activities, while **Holman, Michell & Co., Ltd.,** have an array of their products which include lead sheet, lead pipe, brass rods, and solders; they also show Chevron slotted steel angle components.

Another exhibitor is the **Horstmann Gear Co., Ltd.,** which has a comprehensive range of screw and plain plug and ring gauges displayed; also patented adjustable screw caliper gauges. **Imperial Chemical Industries, Ltd., Metals Division,** have a comprehensive display of copper, brass, aluminium and titanium sheet, strip, extrusions, tube, plate, and wire; 'Kunifer' and 'Alumbro' condenser tubes; 'Kuterlon' copper tubing and I.C.I. tube fittings, including 'Instantor,' 'Kuterlite' and 'Intex P.T.,' as well as 'Kynal' profiled sheet and 'Kynal' roll-welded heat transfer sheet. The Division also makes products for the general engineering, building, transport, electrical, petroleum, and sugar industries, and nuclear power plant.

The **Kleen-e-ze Brush Co., Ltd.,** show conveyor-belt brush units, Kez strip, brushware, condenser cleaning bullets, Florigene dust-allayer, brush-welt, nylon industrial brushware, Keza tube-burnishers, machine brushes, mops, floor-polish, and woodware pallets and trays.

James H. Lamont & Co., Ltd., have a display of copper pipe fiittings, including 'Securex' patent improved fittings for light and heavy gauge copper tubes for cold and hot water supply and steam heating, and also for ship, motor and aircraft fittings; while **Ransomes Sims & Jefferies, Ltd.,** show their forklift and platform industrial trucks and ITW and ITC tractors for industrial use.

The **Rawlplug Co., Ltd.,** show their range of devices for solving every fixing problem. Rawlplug tools for boring holes in any material, and their adhesive products, which include Durofix, plastic wood, Duroglue tile cement, plastic metal, etc. **Rozalex, Ltd.,** show their products for combating occupational skin diseases and for keeping the hands clean and healthy; while **Saunders Valve Co., Ltd.,** display diaphragm valves and cocks for fluid control, rubber, glass and lead linings and various operational adaptations, 'Safran' centrifugal pumps, and single, multi-stage, vertical and self-priming pumps.

The **Sigma Instrument Co., Ltd.,** stand carries an array of multi-dimension inspection machines, including automatic types with magazine feed and conveyor belt sorting for checking mass produced components, mechanical single-spindle and turret types, and pneumatic comparators and bench micrometers; while the exhibit of **Sperryn & Co., Ltd.,** includes 'Spersom' gas thermostats for industrial and domestic use, relay valves and flame failure devices, spring-loaded self-lubricating main cocks and small fittings, a full range of plumbers' brassware, and 'Sperryn' electrical accessories.

Tirfor, Limited, show their portable hand-operated lifting and pulling machine, which can work with any length of wire rope, offering any height of lift or length of pull; while **Walkers (Century Oils), Ltd.,** show their lubricating oils for turbines, compressors, etc., motor oils for petrol and diesel engines, mould, quenching, hardening, hydraulic, drawing, rolling, and dewatering oils, hand cleansers, lubricating greases, and tailored grease blocks.

OVER 100 YEARS' EXPERIENCE IN THE CONSTRUCTION OF ALL TYPES OF GASWORKS PLANT

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From Nuclear Power Station Control to Electronic Toys

INSTRUMENTS, ELECTRONICS AND AUTOMATION EXHIBITION

THERE are still those who tend to shy away from the word automation, and to scout suggestions that modern measuring and control devices could find any application in their own particular industry. It is difficult to believe, however, that anyone harbouring such illusions could fail to have them quickly dispelled by a visit to the Instruments, Electronics, and Automation Exhibition now being held in London in the Grand Hall at Olympia.

For this exhibition must contain at least one example of everything that recent developments in this branch of science can achieve, from such impressive items as the nuclear power station control room 'mock-up' on the stand of **Elliott Brothers (London) Ltd.**, to 'toys' in the 'electronics at work and play' feature, such as a ball which disappears down a hole when the visitor puts out his hand to pick it up—and if this might appear merely frivolous, it should be remembered that a similar application of electronics can be readily adapted to remove or shield something potentially dangerous in a factory from an operator approaching too close.

Metametering

In addition to the nuclear power station instrumentation display, which is the main feature of the Elliott Brothers (London) Ltd., stand, this Company shows a comprehensive array of Bristol's Metametering equipment, familiar and valued throughout the gas industry; electrical weighing equipment; a Fisher Governor display with an example of Swartwout power relay operation; and I.I.C. differential pressure indicating and recording equipment. There is also an example of this Company's analogous computers.

Other exhibitors well known to the gas industry include the **British Rototherm Co., Ltd.**, who show a wide selection of temperature, pressure, and vacuum indicators and recorders; and the **British Thomson-Houston Co., Ltd.**, whose electric motors are familiar in gasworks throughout the country, who show their electronic ignition testers, balancing and vibration measuring equipment, gas leak detectors, and numerous other devices.

The Cambridge Instrument Co., Ltd., have a range of temperature-measuring, fuel efficiency, chemical analysis, and other instruments; while the many exhibits of **Cinema-Television Ltd.**, include their portable metal detector which has proved its worth in the gas industry in the location of mains and other buried metal objects. **Costain-John Brown Ltd.**, whose chemical plant is known throughout the gas industry, show a mobile instrumentation and automatic control testing unit.

The Department of Scientific and Industrial Research, in co-operation with many of the D.S.I.R. research stations and allied research associations, have a display of some 25 instruments of very diverse character. These include a micro-electro-magnetic vacuum balance from the Northern Coke Research Committee of the British Coke Research Association, and an immersion viscometer from the Department's Fuel Research Station.

Flame Failure

Of special interest to the gas industry on the **Electronol, Ltd.**, stand is the inclusion of a wide range of flame failure equipment; while the **Electroflo Meters Co., Ltd.**, show an extensive range of their instrument and control gear. **Ether, Ltd.**, also show flame failure equipment, temperature indicators and controllers, and other instruments.

Evershed & Vignoles, Ltd., exhibit a complete range of electronic instrumentation and control equipment as well as a computer illustrating its application to various instrumentation and control systems; while the **Foster Instrument Co., Ltd.**, display temperature measuring instruments, smoke density apparatus, and introscopes for the internal inspection of tubes and other hollow objects. **The Metropolitan-Vickers Electrical Co., Ltd.**, have an interesting display of their electronic equipment.

Nash & Thompson, Ltd., include in their display a water hardness monitor for the quality control of boiler feed water among many other instruments of interest to a wide variety of industries and applications; while flowmeters are a feature of the **Rotameter Manufacturing Co., Ltd.**, stand; mechanical, pneumatic, and electrical comparators are among the exhibits displayed by the **Sigma Instrument Co., Ltd.**

Firth Cleveland Instruments Ltd., a recently formed subsidiary of **Simmonds Accessories, Ltd.**, show a range of tank contents gauges, liquid flowmeters, specific gravity meters, and liquid level controllers; while a new toxic-combustible gas detector and alarm, capable of detecting very small concentrations of light and heavy gases, including CO, in atmosphere is a feature of the **Alexander Wright & Co., Ltd.**, display.

Yet Another Japanese Order for Power-Gas Corporation C.W.G. Plant

FOLLOWING the recent visit to Japan and the Far East of Mr. E. Coates, the Power-Gas Corporation, Limited, have just been informed that a further order has been placed with their licensees, Mitsubishi Chemical Machinery Manufacturing Company, by the Osaka Gas Company for a carburetted water gas plant for their Torishima works.

This order follows the successful installation of a similar plant for their Iwasaki works. Each installation has a daily productive capacity of 24 mill. cu.ft. and comprises four units each incorporating dry base mechanical generators and reverse flow chequerless carburetting system for the use of heavy oil for enrichment. This has proved very successful with oils up to 10% Conradson carbon.

During the past 2½ years Mr. Coates has made three visits to Japan and the following orders totalling 21 units with an overall daily productive capacity of 80 mill. cu.ft. have been received for carburetted water gas plant of Power-Gas design:—

	APPROXIMATE DAILY CAPACITY
Toho Gas Company, Nagoya.	
Sokorada Works	3 units each 3½ mill. cu.ft.
Kanagawa Works	4 units each 3½ mill. cu.ft.
Shizuoka Gas Company	
Numazu Works	2 units each 500,000 cu.ft.
Osaka Gas Company	
Iwasaki Works	4 units each 6 mill. cu.ft.
Torishima Works	4 units each 6 mill. cu.ft.
Saibu Gas Company	
Higashihama Works, Fukuoka	2 units each 2 mill. cu.ft.
Nihon Gas Company	
Kagoshima Works	2 units each 500,000 cu.ft.

Most of these installations have been manufactured in Japan, but, in certain cases, special equipment has been sent from this country.

Simon-Carves Dividend

Simon-Carves announce a final dividend of 12½% on the £1.5 mill. ordinary shares.

This makes 20% on the present capital for 1956 and compares with an interim of 11¼% on £525,000 and a final of 17½% on £1 mill. for 1955.

The distribution requires £172,500, against £134,586. At the time of the interim holders were warned that the declaration did not indicate a total larger than the equivalent of 16⅝% paid for the previous year.

Group profits amounted to £1,374,024, and compared with £1,385,041.

Presented at the 94th Annual General Meeting of the Institution of Gas Engineers, London, May 14, 1957.

The President's Address

By SIR HENRY JONES, M.B.E., M.A., M.I.C.E., M.Inst.Gas E., M.I.Chem.E.,

Deputy Chairman, the Gas Council.

As a small boy, I had no doubt about the occupation which I looked forward to when grown up. It was engineering. It is with the pride natural to a professional man that I find myself entrusted by you with the office of President. It is with some humility that I address you, aware of the short space during which I hold office in the long succession of Presidents past and Presidents to be.

In this address, only in this short section is reference made to the events of the past year. The 94th annual report of the Council and the reports published in November, 1956, by the Chairmen's Technical Committee and the Gas Education Committee give a full account of the activities of the Institution, and I do not propose to add to them. However, three events have occurred which may affect the future of our whole national economy. First, the power station at Calder Hall, operated by nuclear energy, came into use. This event, like the success of George Stephenson's Rocket, is the forerunner of great developments. We can but admire the skill of the scientists and engineers who have brought this great project to completion. One hopes that only good will come from it, and I do not think that its effect on the gas industry will be unfavourable.

Secondly, the Suez Canal was closed to traffic. This brought home to us as nothing else could have done our undue dependence upon an unreliable channel of communication. Supplies of oil will soon perhaps be as plentiful as before, and not much more expensive, but the memory of what has happened will affect the future planning of energy supplies in Western Europe for many years to come. Already the gas industry has demonstrated that, after several years during which more oil has been used than was economically desirable, in order that coal might be saved, more coal can be used in existing plant in order to reduce the use of oil. These changes are not achieved without cost.

The third event was the passing of the Clean Air Act, which is certain to have a considerable effect on the future pattern of fuel utilisation. It should encourage the use of both gas and coke, and, if it attains its object, will save the nation much money and improve the health of the people.

Before proceeding to the main part of my address, I must refer to Colonel J. A. Gould, M.C., who has, following his retirement from the gas supply industry, retired from the chairmanship of the Gas Distribution Committee on which he has done such good work for many years. His knowledge of gas distribution is far reaching and profound. Fortunately, he is able to continue as a member of the Committee.

Personal Notes

In an address to an institution as accustomed to long family associations as is the Institution of Gas Engineers, it is not appropriate to say too much of the connections of my family with the gas industry. A few words may, however, be permitted, not in any attempt to claim a unique relationship, but to record what may be of great interest.

Mr. Robert Jones, my great-grandfather, began his career at Chester gasworks in 1835. In 1854, after holding appointments at Worcester, Bath and Wolverhampton, he was appointed Engineer to the Commercial Gas Company in London. He later became Deputy Chairman and retired in 1894, the ordinary stock of the Commercial Company, which had been virtually valueless on his appointment, then standing at 275 per £100. He was consulted by a number of other companies. He died on January 1, 1895. He had joined the Gas Institute in 1882.

My grandfather, Mr. Harry E. Jones, was a consulting engineer. He was awarded a Telford Premium and Medal of the Institution of Civil Engineers in 1875, and became President of the Institution of Gas Engineers in 1904. In 1917, he was elected President of the Institution of Civil Engineers. His association over very many years with, among others, the Commercial, Wandsworth, Uxbridge and European Gas Companies will be remembered by some of the older members present today. His earliest training was as a locomotive engineer. He died in 1925.

My father, Mr. Frank Harding Jones, is remembered by so many that even a pious son would not wish to say more than a few words about him. He was a civil and gas engineer whose work in his earlier years extended to many parts of Great Britain, Europe and South America. He is best remembered as President of the South Metropolitan Gas Company and Chairman of the Wandsworth and many other Gas Companies. He was very proud to recall that as a junior engineer he was engaged in the construction of the Tower Bridge.

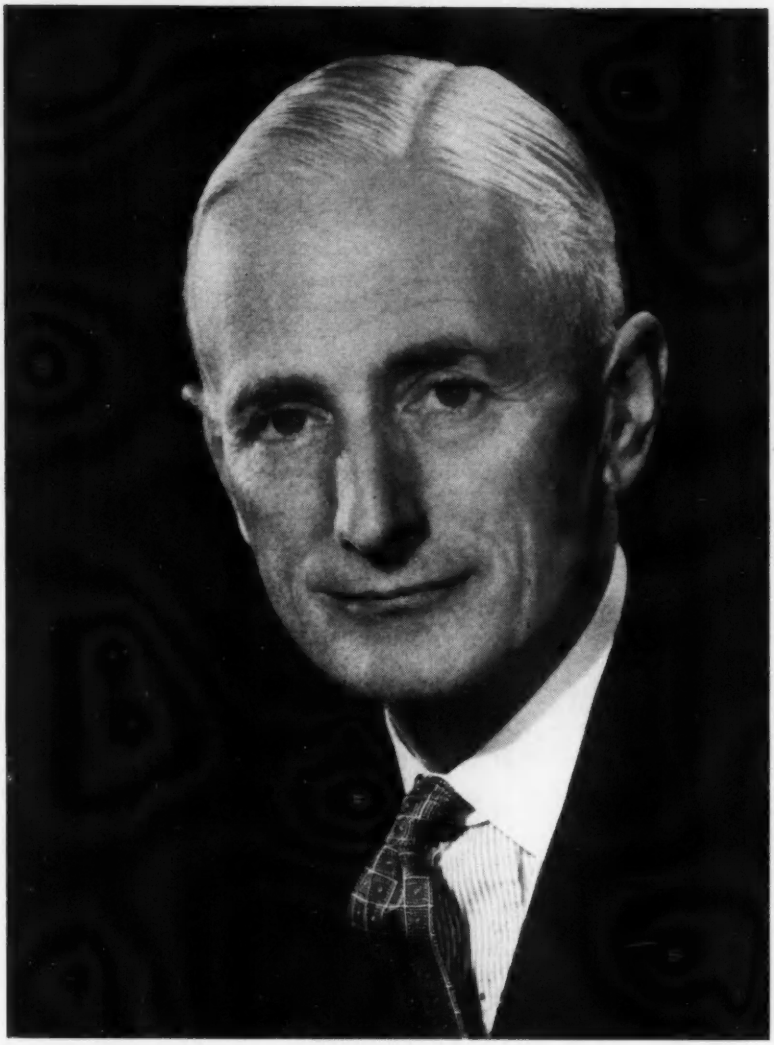
The Gas Industry in Retrospect

During the 122 years for which my family has worked in the gas industry, the country has passed through the greater part of the Industrial Revolution. For example, railways, first a public service in 1821, were extended during the years 1846 to 1850 at an average of no less than 800 miles of track each year. Docks and harbours were constructed, water and sewage works were built, factories spread over the industrial districts, and electricity was supplied for the first time in 1878. By 1914, the gas industry had long since passed from iron retorts to fireclay and from manual to machine charging of coal. The vertical retort had become a real challenge to the horizontal. Water gas plants were installed in many gasworks. Gas lighting was fading and gas heating, which had become common for cooking, was also increasing in popularity for hot water, space warming and industrial use. By-products of carbonisation formed the foundation of the chemical industry. In this connection, Lord Moulton (President of the Institution in 1918) was quoted by my grandfather in 1917 as saying:

> 'Without the direct aid of the gas industry, and, further than that, the assistance and the knowledge which have been acquired by those who devote their lives to it, it would have been perfectly impossible for this country to have waged the campaign of the last three years or even for any but a trifling time resist the overwhelming floods of enemies that were poured upon it.'

After 1914, up to a very few years ago, there were no fundamental changes in the principles of gas manufacture. Improvements of method and of technique, yes; alterations of principle, no. During the last three or four years, new methods of oil gasification represent a departure from earlier practice.

The introduction of the thermal method of charge and the abolition of illuminating power as a standard by the Gas Regulation Act, 1920, enabled gas manufacture to be carried out with greater efficiency and economy. Vertical retorts are now much more common. Silica has largely replaced firebrick. Heating systems of carbonisation plants are more effective, plant design has improved enormously, electrostatic de-tarrers are in general use, and power utilisation on gasworks has been revolutionised. But gas is still made mainly from the



SIR HENRY JONES

carbonisation of coal and the manufacture of water gas. It is still washed with water, purified by iron oxide and stored in gasholders, most of which are of conventional types.

The gas industry may well be at a turning-point in its history. In a few years time it will perhaps be possible to point to the years 1955 to 1965 as the period during which new methods of gas production began to come into full-scale use.

Relations of the Engineer to Society

During much of this long period, the management of the industry was firmly in the hands of the engineers. The gas engineer of old was, as a rule, undisputed head of his company or department under a board of directors or gas committee. Later, he became known as engineer and manager, or in some cases, engineer, manager and secretary. The order of these titles, besides being alphabetical, clearly shows the importance which was attached to their respective duties. Nowadays, the engineer shares with colleagues who have risen through the commercial, accounting and other departments the responsibility for managing the industry. This is so because as organisations become larger and more complex the parts played by accountants, administrators and those concerned with staff and labour matters become larger too. When gas undertakings were almost all local, in the sense that inter-linking by gas mains of non-adjacent towns was a rarity, and when contiguous boroughs would each develop their gasworks regardless of their neighbours, the gas engineer, or engineer and manager, was a man of considerable local standing, identified closely with his undertaking and, except for professional ties, or for duties on national and district committees, little concerned with affairs outside his own district.

Today, while some of our colleagues are still holding such positions, many have duties which cover whole counties, or several counties, and, although demands on their skill and ability are probably greater than ever before, they may sometimes feel that in the eyes of the public their dignity and standing have been reduced. This is not to say that our forefathers were always contented with their lot. My grandfather's Presidential Address in 1904 contained the following words in relation to engineering appointments:

> 'One cannot but remark on the unsatisfactory and inadequate nature of the emoluments too often afforded to the responsible and laborious services entailed.'

The position of the engineer in society today is changing. For one thing, he is becoming more and more closely associated with scientists, especially the chemists and physicists, and for many years both engineers and scientists have enjoyed membership of this Institution. Non-scientific and non-technical folk, however, sometimes seem to regard engineers as useful people when a job has to be done, but otherwise of less account than themselves. Some parents and schoolmasters are said to discourage really able boys from the study of scientific subjects. I hope that those who regard men of science and engineering

as less important than those trained in the humanities have read the remarkable Graham Clark Lecture delivered in April, 1956, to a joint meeting of the Institutions of Civil, of Mechanical and of Electrical Engineers by Sir Maurice Bowra, Warden of Wadham College, Oxford. I will quote some sentences from this lecture:—

> 'Though I am much honoured and flattered by your invitation to speak to you this evening, I cannot conceal that I have no qualifications to do so. I am, I fear, a living fossil, a specimen of unmechanised and even of pre-mechanised man, in my own way as outdated as the coelocanth or the metasequoia. I cannot drive a car. I typewrite with two fingers. I am singularly maladroit when it comes to mending the most humble things. But perhaps it may be instructive for you to know that such people exist, for whom your own resplendent universe of intellectual endeavour is a closed mystery, an enchanted domain which they indeed admire from outside but whose secrets they can never hope to share . . . .
>
> 'I would ask you to look upon me as just such an aboriginal, snatched from his own world and fascinated by the mysteries of yours. My own studies are concerned with the study of man, even if they approach him from a rather special and specialised angle, and no student of man can afford to be unaware of what engineering means in history. I will therefore do my best to speak from my own standpoint and hope that it will not seem to you to be too misinformed, too reckless, or too infantile . . . .'
>
> 'Archimedes was not only a mathematician of incomparable genius but at times turned it to practical uses, as when he invented hydrostatics or devised engines of war to confound the Roman besiegers of Syracuse. Yet, despite these promising beginnings, the Greeks stopped and did no more for engineering. Nor did the Romans after them. And for this, like the Chinese, they paid a heavy price. If the Romans of the later empire had only had another Archimedes to invent new engines of war, they would have had no more difficulty in disposing of Attila and Alaric than Kitchener had in disposing of the Khalifa. The trouble with a society which does not believe in engineering or see its possibilities is not that it cannot be civilised, but that it is not likely to survive. Civilisation is a sensitive plant, and its first duty is to look after itself . . . .'
>
> 'The Romans, like the Chinese, rejected machines in the last resort because their ruling classes were snobs . . .
>
> 'The engineer works within his own social frame, and as the modern world is organised into national states, his work has to be shaped to suit them and their demands. Within these limits his work is a strong stabilising influence. On the one hand it avoids the angry discontent which is inevitable when no change seems possible, and on the other the complacency which assumes that everything is after all as good as it can be and that nothing need be done about it. Unlike the fine arts, which are always having to make a fresh start because something has been done so well that it cannot be done again, it moves in an ordered progress in which every new step is a real advance and leads to others beyond it. Such a process satisfied both man's desire for order and stability and his love of novelty . . . .
>
> 'Though our own century has made technical advances quite as great as those of the nineteenth, it has not enjoyed that prolonged peace which Great Britain enjoyed from 1815 to 1900 or that sense of security which is based on the belief that most social problems can in the end be solved by a more generous distribution of material goods. Both international war and class war have dominated and damaged our lives despite the obvious increase in most countries of prosperity and ease. For this we must blame man in his capacity of a political animal. He has failed to evolve means by which his desire for security and prosperity can be combined with other darker and less rational forces in his nature . . . .
>
> 'As the Greeks said "even the gods do not fight against necessity," and for us engineering has become a necessity. It is madness to fight against it, to wish that it had never been. It has brought untold benefits to the world, and if it has often enough been held responsible for our catastrophes, it is we, and not it, who are to blame.'

It is sometimes believed, by those who know no better, that, because scientific and technological progress is so rapid in time of war, scientists and engineers are in some way responsible for wars and do not regard them with the same dread and horror as their fellow men. I believe this to be the opposite of the truth. Certainly, when vast funds and almost limitless material resources are placed at their disposal, men can invent and develop marvellous things, but no one is better equipped than an engineer to value the destruction caused by war and to estimate the cost of waging it. Perhaps the best hope for a long period of peace is that countries with a high standard of living, brought about by tremendous developments of technology, will be loth to jeopardise it; and that those which are in a period of rapid technological development of hitherto little-used national resources may appreciate that, whatever can be gained by war, more is lost.

For those countries in Asia and the Middle East in which the standard of living of millions is hardly above survival level peace is essential, if the lot of the peasant and labourer is to be bettered even a little. In all these countries, engineers, by providing the means to improve the standards of living, can help governments to remove the discontents which lead to war.

Status of the Institution and its Members

Engineers, while holding their heads high, must not claim that they have a monopoly of knowledge; but they have a duty to make known their skill and to establish themselves more securely than at present as the men who know how to apply technical developments for the good of all. At the same time, we must realise our responsibility to our non-technical colleagues. If we say that something can be done, at a certain cost, within a certain time, we must be sure of our facts. Before we say that a thing can *not* be done, we must be even more certain of them.

The first society formed by engineers was founded in 1771 by a Mr. John Smeaton, who formed the Society of Civil Engineers. In 1818, the Institution of Civil Engineers, in whose building this 94th annual general meeting is being held, was founded. Thomas Telford, its first President, was born in 1757, just 200 years ago. The British Association of Gas Managers was formed in 1863 and grew to a membership of 675 in 1881, in which year the name of the Association was changed to the Gas Institute. In March, 1890, the Incorporated Institution of Gas Engineers was founded in spite of opposition and protests by the Gas Institute. Membership of the Institution was not extended to engineers working in manufacturing firms. The two bodies were amalgamated in 1902 into the Institution of Gas Engineers. The Royal Charter was granted in 1929. The century which elapsed from the birth of the gas supply industry until the foundation of the Institution in its present form saw the industrial development of this country on a scale which today it is hard to imagine.

Papers Compare Favourably

The names of the great engineers of the past who built the bridges, such as those over the Thames, the railways, and the other works to which reference has been made, were household words: Telford, Rennie, the Stephensons, George and Robert, Isambard Kingdom Brunel, Sir Benjamin Baker, Thomas Hawksley, and many others. Practice during these years was supported by theory developed by such men as Rankine, Lord Kelvin and Osborne Reynolds. In the gas industry, too, great engineering works were built. The gasholders in masonry tanks designed by Sir George Livesey, whose 8 mill. cu.ft. gasholder at East Greenwich was constructed in 1886, followed in 1891 by one of 12 mill. cu.ft. capacity, are remarkable engineering structures. In a different element, the sea defences at Portslade gasworks, near Brighton, designed by J. B. Paddon in the 1870s, were equally remarkable.

The Institution today has 3,372 Members, Associate Members and Associates. Its requirements of qualifications for membership are as high as those of any institution of engineers. The standard of papers presented at our meetings compares favourably with those of papers presented to other professional bodies. The Institution, however, is closely related to one industry, the gas supply industry, and although some members are employed outside the gas supply industry in this country, the fortunes of the majority of members are inseparably linked with those of the public utility industry in which they work. The younger members, knowing as they do of the tremendous developments in the oil industry and the even more spectacular progress of nuclear energy, may be forgiven for wondering where their future will lie. Later in this address, I shall explain why I believe that anxiety about the future of the industry is quite unnecessary.

Younger members, however, may also feel some anxiety that the highest positions in the industry may not be as open to them as they have been hitherto. They may feel that those with experience of administration, finance and labour matters have better chances of reaching the highest levels of management in the industry. Quite clearly, only a small proportion of those entering the industry by way of any department can reach the highest positions. Such people are not found only in the ranks of the engineers and scientists, and a young engineer wishing for promotion must try to develop qualities additional to those for which he has been primarily trained.

He must be a sound engineer respected by his colleagues in the branch of engineering within which he works, but he must also cultivate the art of 'getting on' with people and develop his powers of leadership so that by example as much as by discipline he can secure the confidence of those working under him. To achieve this he should cultivate an interest in his fellow men. Engineers who have not already done so should master some of the principles of accountancy, so as to understand a balance sheet, and be capable of discussing costs with accountants. They must also learn to plan for years to come. An engineer responsible for the operation of a works may make mistakes, and as a result the cost of running that works may be more than it should be. This is a matter

which can be put right by finding a better and more capable engineer to run the works, and may take months or a year or two, but not more. An engineer responsible for the planning and carrying out of works for capital development has a greater responsibility. His mistakes, unless discovered in time, may lead to a waste of capital money, the effect of which will be felt over a long period of years and which cannot be corrected by the comparatively simple course of finding another engineer.

It is perhaps not sufficiently appreciated that all expenditure, whether on capital or revenue account, eventually has to be recovered from the customer, the only difference being that expenditure on revenue account is normally recovered during the year in which the money is spent, whereas expenditure on capital account augmented by the necessary interest charges is recovered over a period of years. All engineers in responsible positions must be capable of considering the financial implications of their work. A further quality essential in the engineer who wishes to progress is the power to convey his thoughts in clear and simple language. Provided that his thoughts are clear and well ordered, the technical man while not necessarily able to achieve the grace of a professional writer, should be capable of concise and lucid expression. Excellent books can be bought which give guidance on the writing of English, and every young engineer should own one of these.

Area gas boards and large engineering firms recognise that engineers and other professional men need opportunities to gain experience in management and to broaden their characters and personalities if they are to be fitted for what is now known as 'top management.' The Gas Council has arranged so far for 12 six-week courses in management at Brooklands County Technical College, Surrey. It is a matter of great pride to the Institution that these courses have followed the pattern set by the two courses arranged by the Institution at Brooklands in 1953 and 1954.

Future of Gas Supply Industry

The industry has now been operating for nearly 150 years during which steady development, rather than dramatic growth, has been its habit. Is this steady progress shown on the chart to continue, will development become more rapid, or will there be stagnation and, ultimately, decline?

References in the Press and elsewhere to 'atomic' power stations have encouraged the belief that, before long, nuclear power will solve all our energy problems. The programme of construction of nuclear power stations announced by the Minister of Power is, of course, impressive and will make a substantial contribution to the energy needs of the country. But it is important to remember that the nuclear furnace is essentially a source of heat. Because of the comparatively low temperature at which this heat can be developed with the techniques and materials now available, and the large quantity of heat which has to be produced if the nuclear furnace is to be economic, the generation of electricity is the most convenient way of using this heat at the present time. This involves, more than with a coal-fired station, the disposal by way of cooling towers, of a large proportion of the heat generated, only about 25% being converted into useful electricity.

The advantages of nuclear energy include the introduction of a completely new source of energy, low fuel cost, and the possibility of storage of huge quantities of fuel. The capital cost is, however, very high. It is such that, in effect, the electricity made in these stations, if supplied at 66⅔% load factor over a 20 year period (if this can be assumed as the life of a nuclear power station), is being paid for 'in advance' during a five year construction period to the extent of 0.28d. to 0.34d. per unit, or 8.2d. to 10.0d. per therm. This represents a very heavy burden on the economy, not only in money but in steel, manpower and fuel during the construction period. A gasworks of similar output would only impose a burden, using the same calculations, of 2.3d. per therm supplied during 20 years to be borne 'in advance' during a five year construction period. If a 40 year life were assumed, these figures would be halved, and for the gasworks, at any rate, a life of 40 years might be regarded as reasonable. The basis of this statement can be seen in the appendix, with calculations based on 50, 66⅔ and 75% load factor. The average load factor on existing power stations is about 50%.

If peak loads are considered, we must remember the evidence submitted by the Gas Council to the Ridley Committee (Cmd. 8647). This concerned the domestic load, which substantially affects the peak demands for electricity. The Gas Council showed that to provide a domestic consumer with heat for cooking and wash boiling by gas would require £41.8 of capital investment, whereas to perform the same functions by electricity (based on coal-fired power stations) costs £125, or three times as much. If nuclear power stations are to be used, the cost will be higher. There is no parallel in the gas industry to those very large companies which manufacture plant for the generation of electricity, and also domestic equipment which stimulates the demand for more generating plant, much of the domestic equipment being used at peak-load times. Nor do I know of any parallel among area gas boards to the practice of one area electricity board of selling electricity to domestic consumers at an average rate lower than that charged to industrial and commercial customers. I hope that the disadvantages of the undue stimulation of domestic demand for electricity will become manifest, perhaps even to the electrical industry. Gas will then meet competition from electricity on a fairer basis than now in that part of the domestic heating market for which it is so well fitted.

Methods of Gas Manufacture

I suggest that, if the industry is to prosper as it should, we must set up three targets at which to aim:—

(1) The composition and pressure of gas should be sufficiently constant for consumers to be unaware of any variation in the performance of their appliances and equipment.

(2) Gas should be of low sulphur content.

(3) Price of gas should be competitive when compared with other sources of heat.

There would be no difficulty in complying with the first two requirements if the last, that is, price, could be ignored.

If present trends of coal production continue, large and graded coals will become scarcer and small coals, usually of low rank, will become relatively more plentiful. The steel industry will demand increasing quantities of carbonisation coals, but, sooner or later, as nuclear power stations are built the demand for coal for steam raising will diminish. This suggests that, within the next ten or 20 years, small coal may become difficult to sell and may be available for gas manufacture at prices which will permit a really efficient process to produce gas at costs which will compete with all other sources of energy. On the other hand, oil will be available in the world in increasing amounts and it is only prudent to allow for the possibility that gas made from the products of oil refineries, gaseous or liquid, which are in surplus from time to time may be as cheap as or cheaper than gas made from coal.

The needs of the industry call, therefore, for processes of gasification capable of accepting wide ranges of qualities of coal and of petroleum products, including imported methane. It seems likely that processes, largely based upon the work of Dr. F. J. Dent, for the gasification and hydrogenation under pressure of coal and oil, with ash extracted as molten slag from coal gasifiers, will be among those which will in future years be found to combine economic generation and efficient purification with the production of gas of suitable quality. The use of imported gas may prove to be a new and vital development, and would be a valuable addition to other sources of material.

Decade of Change

It may be that this decade 1955 to 1965 will be looked back upon as the last during which area gas boards built carbonising plant for gas production, although they may still build such plant to produce essential solid smokeless fuel if supplies of coal for this purpose can be as assured as those which now feed the coke ovens of the steel industry. This may also prove to be the last decade in which iron oxide purifiers of traditional types are erected. It may see the construction of the first installations designed for the manufacture of gas under a pressure of several atmospheres.

If a large supply of natural gas were found in this country, expansion in the sale of gas would soon occur. In its absence,

there is a challenge to the members of this Institution, engineers and scientists, to create the process and build the plants to make it possible for gas made from coal and oil or from imported natural gas to be supplied on terms which ensure a substantial increase in its use and consequently an improvement in the efficiency of fuel utilisation by the nation.

One can see in other industries the improvement and perfection of old processes to the point at which they can be said to have received a very high polish, and then one day a new process is introduced. The new process may require heavy capital investment, but if, in spite of this, the product is better and the running costs are lower, the older process, no matter how elegant, will be displaced, and firms which continue to depend upon it will go out of business. Existing methods of gas production have probably not reached the limit to which they can be developed, but it is time to consider the possibility that new processes, albeit requiring considerable investment, can revolutionise our industry in an age which will see the introduction of nuclear power at a rate which will increase geometrically.

The gas industry always has been and always will remain a supplier of fuel. It converts less-convenient fuels, which can only be transported with some difficulty, into a fuel which can be used with the utmost convenience and which can be transported with great ease. A high grade of raw material may be comparatively costly, but capable of being converted into gas by a cheap process. The crudest and lowest grade raw materials, which are usually the cheapest per therm, require processes of gasification which may be more costly, but which will often produce gas at a lower price per therm. Other things being equal, the cheaper the raw material the more likely it is that the gas made from it will also be cheap; but to gasify a cheap raw material plant with heavy capital investment is likely to be needed, and this will be economic only if used for the manufacture of base-load gas.

The Peak Load

If substantial increase occurs in the use of gas for space heating, more peak-load gas will be needed. Two solutions to this problem may be considered. The base load may be provided for by highly efficient, but probably costly, plant using the cheapest available raw materials. The peak load would be met as now by bringing in to use successive units of plant, less costly to buy, but more expensive to run, and using refined raw materials such as light hydrocarbon oil, liquefied petroleum gases or town gas itself stored underground.

The other possibility, if a surplus of small coal becomes available, would be to provide for the peak load, or most of it, by installing sufficient 'base-load' coal gas plant to meet the peak load and to use surplus gas-making capacity to provide synthesis gas for oil production at all except peak-load times. This scheme has the attraction that more motor fuel would be made in the summer, when it is in highest demand, and more town gas in winter; but it needs one essential—a reliable supply of coal. The choice between the two systems, assuming that not only the coal, but also the technical knowledge, is available, will depend partly on the relative capital costs of the gasification and synthesis units and partly on the shape of the curve showing weekly gas demand throughout the year.

Size of Gas-manufacturing Units

In any case, the size of unit for most economic operation will need careful study. Both of the gas industry's main competitors, the oil industry and the electricity supply industry, now use units of plant at their refineries and power stations far bigger than was possible only a few years ago: For example, the largest turbo-alternators used or planned to be used in Great Britain at certain dates are shown in the table.

		Size of Largest Unit		
		Megawatts	Approximate Therms per Hr.	Equivalent as Mill Cu. Ft. per Day (500 B.Th.U.)
Actual	1920	30	1,024	4.9
	1930	50	1,706	8.1
	1940	105	3,584	17.2
	1950	105	3,584	17.2
	1956	105	3,584	17.2
Planned	1960	200	6,826	32.8
	1965	550	18,766	89.5

Existing methods of gas manufacture (carbonisation, carburetted water gas and catalytic oil gas plant) do not lend themselves to very large-scale units, but only to a multiplicity of retorts, coke ovens or generators. If full advantage is to be taken of modern chemical engineering techniques, processes are needed which can be built into large-scale units. Only in this way can high capital cost be balanced by even higher proportionate outputs. Really large units of production will demand more transmission mains and fewer gasworks. This may lead one day to a national plan for gas production at quite few centres in the coalfields and at the oil ports, with local gas production only where coke is made near to the large centres of consumption to meet essential needs, and where peak-load gas can be made economically.

It should not be thought that existing gasworks with their valuable equipment, which are supplying such vast quantities of gas, coke and chemicals, will become obsolete overnight.. More likely, following the successful completion of one large high-pressure works based on coal, and of one using oil, new carbonising plant would not be built except to provide solid smokeless fuel.

Development of Gas Sales

The future demand for smokeless fuel will be large, and all concerned with fuel supply are waiting to see how quickly local authorities use their powers under the Clean Air Act, 1956, to prescribe smoke control areas. The gas industry is well placed to supply from existing plant more gas and more coke. As soon as a firm trend in demand for smokeless fuel can be distinguished, the industry can review its present plans for gas and coke production so as to allow for a larger output of both.

Although it may seem that, in the very long run, gas will replace solid fuel to an extent which today it is hard to imagine, at the present time, as stated in the report of the Beaver Committee (Cmd. 9322), an immediate and substantial start towards clean air can be made by the use of solid smokeless fuel to replace most of the bituminous coal now being burned in homes. Furthermore, much of this fuel will have to be gas coke, 16 cwt. of which will replace at least 1 ton of coal burnt in the home. This is not the occasion on which to examine the details of markets in which sales of gas may expand. Potential demand in the domestic field is discussed in L. W. Andrew's Paper, 'Domestic Utilisation of Gas and Coke' (Communication No. 488). Sales of gas to industrial and commercial consumers already show steady increases year by year. It can be shown that an increased use of gas and coke in place of solid fuel and electricity would lead to large savings in the use of coal. An indication of what might be achieved can be seen from the Gas Council's evidence to the Ridley Committee (Cmd. 8647), in which a possible saving in consumption of coal of 15 mill. tons per annum was shown to result from an increased use of gas and coke in the home.

The present (1955) consumption of fuel in the domestic market is equivalent to 65.5 mill. tons of coal, of which 9.4 mill. tons are provided by gas and 13.1 mill. tons by electricity. If only 10% of the solid fuel now used were replaced by gas, the increased demand would amount to 4.2 mill. tons of coal equivalent, or 630 mill. therms of gas, equal to 24% of all gas sold in 1955-56. In industry (other than iron and steel) the consumption of fuel in 1955 expressed as coal equivalent was 73.9 mill. tons, of which gas provided 4.1 mill. tons, oil 8.9 mill. tons, and electricity 17.9 mill. tons. If only 10% of the solid fuel used were replaced by gas, the increase in gas sales would again be 630 mill. therms, equal to 24% of all gas sold in 1955-56. These amounts would be additional to the sales likely to arise from increased demands for fuel on account of higher standards of living and greater output from industry and commerce.

In some respects, gas sales are like what some people call 'self-aggravating phenomena,' such as heating of coal heaps: The hotter the coal the greater the rate of heating. If, by a reduction in production costs, gas can be offered more cheaply, sales will increase, costs of distribution and of overheads will diminish expressed as costs per therm, and the consequent further lowering of prices will lead to yet more sales, and so on. One must add also 'and *vice versa*.'

I have tried in this address to discuss first the work of engineers in past days, to whom we owe so much both for their works and for the example of high achievement which

they have set. I have tried also to indicate how, within the bounds of present knowledge and of economic necessity, the engineers of today, no less in stature than the giants of old, will enable the industry to play its part in providing energy for the nation's future needs. No one can claim that he wears the mantle of a prophet, and perhaps this address merely says that in future the gas industry must preserve that essential flexibility in its methods of gas manufacture which has existed since the introduction of carburetted water gas at the end of the last century.

Certainly, I am sure that no opportunity of developing promising processes must be missed whether based on coal or oil or methane.

In conclusion, I must record my admiration for the work which Dr. W. T. K. Braunholtz and his staff do for the Institution and for Presidents. Without his calm and kindly efficiency, the task of a President would indeed be difficult, and I am most grateful to him. The warmth with which I have been greeted by the District Sections, the Scottish Association of Gas Managers, and the Irish Gas Association, has been something which I shall always remember. The Junior Gas Associations also have greeted me with an enthusiasm which I shall not forget. I owe the Chairman of the Gas Council an especial debt of gratitude for the way in which he has made it possible for me to carry out my tasks. I am grateful, too, to all the members of the staff of the Gas Council who have helped me so much throughout the past year. Dr. J. Burns, the Senior Vice-President, and Mr. E. M. Edwards, the Junior Vice-President, have given me the greatest possible support and help, and I hope that Dr. Burns will enjoy his year of Presidency as much as I have enjoyed a year which will always be a landmark in my life.

APPENDIX

COST OF PLANT PER UNIT OF TOTAL OUTPUT OF GAS AND ELECTRICITY OVER A PERIOD

	Load Factor (per cent)		
GASWORKS :	50	66⅔	75
Cost of plant (per therm per day + 10% for loss)*	£46	£46	£46
Therms produced per therm of plant capacity per day (capacity less 10% for loss)—			
In 40 years (approx.)	7,300	9,800	11,000
In 20 years (approx.)	3,650	4,900	5,500
Initial cost of plant per therm produced—†			
During 40 years	1·5d.	1·1d.	1·0d.
During 20 years	3·0d.	2·3d.	2·0d.
NUCLEAR POWER STATION :			
Cost per 1 kW capacity (+ 10% for loss)‡	£165 £136	£165 £136	£165 £136
Units available per kW capacity (capacity less 10% for loss)—			
In 40 years (approx.)	175,000	234,000	263,000
In 20 years (approx.)	87,500	117,000	131,500
Initial cost of plant per unit available —†			
During 40 years	0·23d. 0·19d.	0·17d. 0.14d.	0·15d. 0·12d.
equivalent per therm§	6·7d. 5·5d.	5·0d. 4·1d.	4·4d. 3·6d.
During 20 years	0·45d. 0·37d.	0·34d. 0·28d.	0·30d. 0·25d.
equivalent per therm§	13·2d. 10·9d.	10·0d. 8·2d.	9·8d. 7·3d.

* The capital cost for gasworks plant plus storage capacity per therm of daily output was quoted by the Ridley Committee (Appendix III, para. 23) as £42, and allowing for distribution losses £46.

† Capital cost only, without interest.

‡ The capital cost of a conventional generating station per installed kilowatt (not including transmission) was given by the B.E.A. (Report 1950/51) as £50. This figure was comparable with that accepted by the Ridley Committee, which added 10% for distribution losses, making £55. The capital costs of a nuclear power station (not including the fuel) were estimated to be three times those of a conventional station, i.e., £165. At the press conference on March 5, 1957, following Lord Mills' announcement of nuclear power plans, the figure quoted per kilowatt was £124 (plus £29 per kilowatt for the initial charge of atomic fuel); with 10% added for distribution losses, this gives £136.

§ These figures are based on a direct conversion at 29·3 units per therm.

Clean Air Year Book

THE 'Clean Air Year Book, 1957,' published by the National Smoke Abatement Society, is a useful compendium of the basic information about air pollution in Great Britain and the increasingly active campaign to prevent it. The Clean Air Act is explained in simple outline, with references to those parts already in operation and the regulations issued by the Ministry of Housing. There is also information about other legislation relating to air pollution—the Alkali Works and Road Traffic Acts, smokeless zones, etc. Other articles and notes describe such matters as the investigation of air pollution, the training of boiler operators, major smog disasters, estimates of pollution, a synopsis of the subject for the guidance of lecturers and writers, together with classified lists of publications, and of recent papers and reports.

A table of this history of air pollution campaigning in Britain shows that the first attempt to prohibit the use of coal in London was made in 1273, and that nearly 700 years elapsed before the first smokeless zone came into being—in Coventry—in 1951.

The Year Book also contains information about the N.S.A.S.—its annual report, accounts and details of the services it provides. In its comments on the general situation, the report expresses satisfaction at the passing of the Clean Air Act, and stresses that its success now depends very largely on the local authorities who will administer it. All-round progress is noted, but 'it is doubtful whether it has yet reached anything like the level needed to achieve the Beaver Committee's programme in the estimated 10 to 15 years. Everything is moving in the right direction, but it is moving much too slowly.'

'Health in the Home'

THE Gas Council's latest publication, 'Health in the Home,' is a lively little booklet which will make a strong appeal to the modern housewife. It contains some practical advice on how to keep the family in good health by sensible feeding and hygiene, and shows the various ways in which gas contributes not only to the easy running of the home, but is 'on tap' for everyday needs. There are first-aid hints and simple keep-fit exercises as well as advice on choosing equipment; and under the heading 'Don't Slip on a Banana Skin!' there are 14 safety Do's and Don'ts aimed at making the domestic kitchen a less dangerous place than—as we know only too well—it unfortunately is. There is also a little useful information about the Clean Air Act and the consumer—and a reminder that 'Mr. Therm snuffs out smoke!'

Refrigerated Air Conditioning

A NEW British Standard for rating and testing of refrigerated air conditioning units (B.S. 2852: 1957) is the second in a series dealing with the rating and testing of industrial refrigeration units and components; others in the series are, 'Rating and testing of open type condensing units for refrigeration' (published as B.S. 1586: 1949) and 'Rating and testing of refrigeration compressors' (in course of preparation).

Copies of this standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1, price 12s. 6d.

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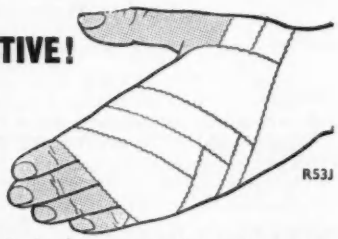

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10	Brooks	Totaly enc.	960
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(*Classified advertisements continued on page* 342)

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ENGINEER familiar with the gas and/or coke-oven industry and works practice, who can write clear and concise English, required for monthly technical journal. No. 323 *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

INDUSTRIAL GAS FITTER required for installing gas equipment and lighting up Furnaces and Stoves. This is a good opportunity for a Student Industrial Gas Engineer. Must be willing to travel. Good salary and travelling allowance. Modern Furnaces & Stoves Ltd., Booth Street, Handsworth, Birmingham, 21.

SCOTTISH GAS BOARD

CENTRAL DIVISION
DUNDEE GROUP

APPLICATIONS are invited for the post of OFFICE MANAGER, Dundee Group.

Applicants should have a recognised accountancy qualification and sound experience of general office routine and organisation, with the ability to control staff.

The commencing salary will be within Grades A.P.T. 10/11 of the National Scales for Gas Staffs (£860 to £1,015 per annum) with placing according to qualifications and experience.

The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications, stating age and giving particulars of education, training, experience and qualifications should be addressed to reach the undersigned within 10 days of the appearance of this advertisement.

W. NICOL BAIRD,
General Manager—Central Division.

Scottish Gas Board,
Gas Works,
Friarton,
Perth.

May 2, 1957.

NORTHERN GAS BOARD

DARLINGTON DIVISION
DIVISIONAL CHIEF ENGINEERING ASSISTANT

APPLICATIONS are invited for the above vacancy. Duties of the post include the preparation of plans, specifications, maintenance and control of all engineering and constructional projects connected with the Division.

The minimum grading for this post is Provincial 'A' Grade APT. 10 (£860 to £960), but the Board reserve the right to place the occupant, either at the time of appointment or later, in Grade APT. 11 (£895 to £1,020) should his qualifications, experience or performance of the duties of the post merit such higher grading.

A house can be made available under a service tenancy agreement.

Corporate membership of the Institution of Gas Engineers or equivalent is essential.

The post is pensionable and the successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be received by the undersigned not later than May 22, 1957.

F. WILSON,
Divisional General Manager.

Gas Offices,
John Street,
Darlington.

DRAUGHTSMEN are required by the NORTH THAMES GAS BOARD at its TAR AND AMMONIA PRODUCTS WORKS at BECKTON, EAST HAM, E.6.

The posts offer possibilities of obtaining experience in the expanding field of chemical engineering for applicants who have had a sound mechanical training.

Starting salary will depend on age and experience.

The successful candidate will be required to join the Staff Pension Scheme.

Applications, giving age and full particulars, to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, W.8, quoting reference 666/389.

WEST MIDLANDS GAS BOARD

INDUSTRIAL DEPARTMENT

APPLICATIONS are invited for the position of ENGINEERING ASSISTANT on the staff of the Industrial Gas Officer at Brasshouse Passage, Broad Street, Birmingham.

Candidates should preferably hold a degree in Science (Engineering) or the Higher National Certificate in Mechanical Engineering.

Experience in the design of gas or other fuel fired furnaces would be an advantage.

The salary for the post is within A.P.T. Grade 11 (£895-£1,020 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him not later than May 27, 1957.

K. W. NEVETT,
Industrial Relations Officer.

EAST MIDLANDS GAS BOARD

NOTTS. & DERBY DIVISION
APPOINTMENT OF TECHNICAL ASSISTANT (GRID CONTROL)
DIVISIONAL HEADQUARTERS, DERBY

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT (Grid Control) on the staff of the Divisional Engineer at Derby.

The successful applicant will be responsible for the supervision of the shift Grid Control Assistants and the day to day operation of the Divisional Gas Grid under the general supervision of the Assistant Divisional Engineer.

The minimum qualification required is the Higher Grade Certificate in gas manufacture; the possession of a qualification in distribution would be an advantage.

Applicants will also be expected to have a good all round knowledge of all types of gas works plant as the appointment is concerned with general duties associated with technical and engineering matters at any of the works in the Division.

The appointment will be made initially in A.P.T. 9 (£795/£895), but there will be scope for some further advancement dependent on the ability of the person appointed to assume greater responsibilities.

Applications stating age and giving details of education, qualifications, present position and experience, together with the names of two referees, should be submitted to the undersigned not later than May 25, 1957.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts. & Derby Division,
P.O. Box No. 62,
Friar Gate,
Derby.

CARBONISATION TECHNICAL OFFICERS required in Engineering Section of N.C.B.'s Carbonisation Department at London Headquarters. Considerable experience in design and construction of coking plants and gasworks required, preferably with a recognised qualification in mechanical or civil engineering. Appointments (superannuable), according to qualifications and experience, within inclusive ranges £1,714-£2,264, or £1,271-£1,814.

Write, stating age, education, qualifications and experience to National Coal Board, Staff Dept., Hobart House, London, S.W.1, marking envelope X/736B, before May 28, 1957.

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The position is pensionable, and the successful candidate will be required to pass a medical examination.

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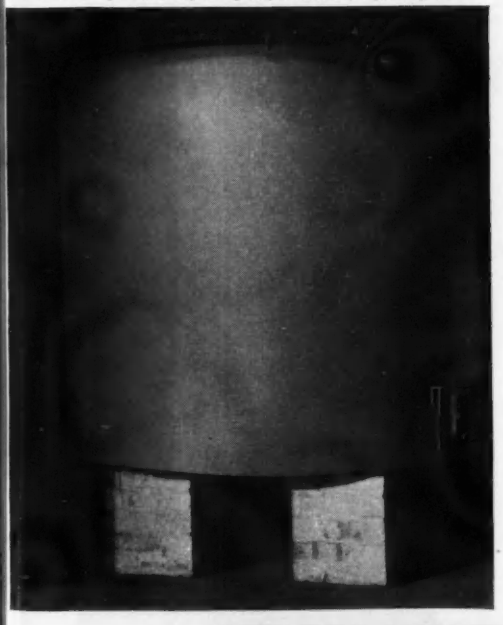

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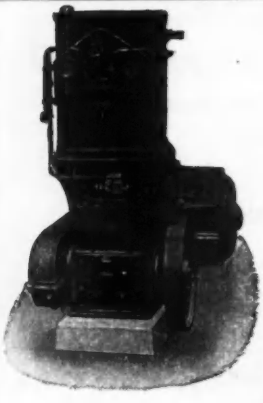

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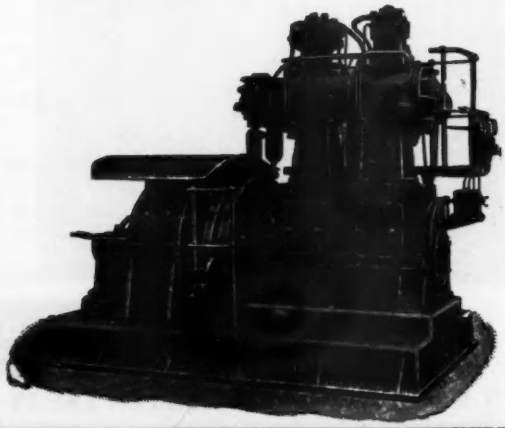

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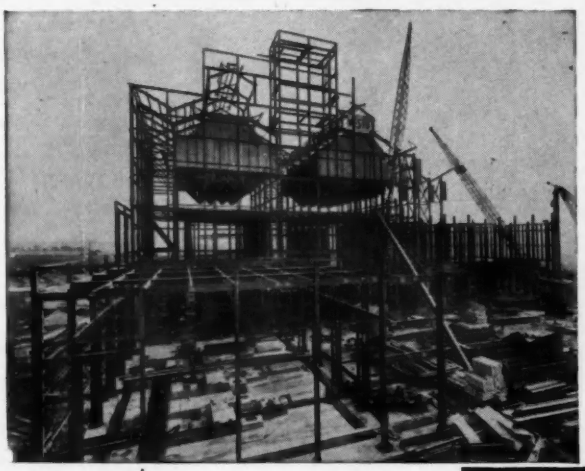

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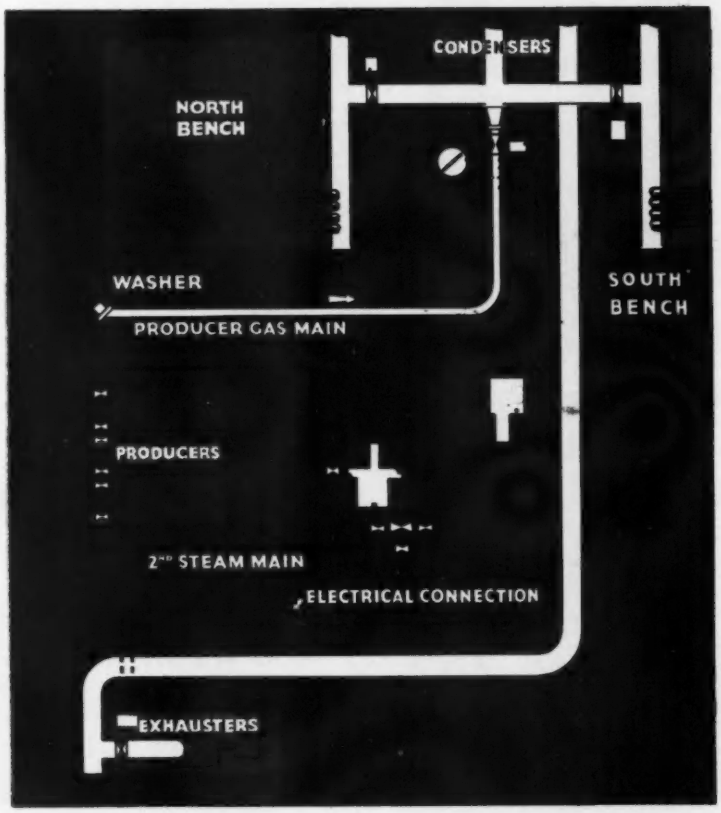

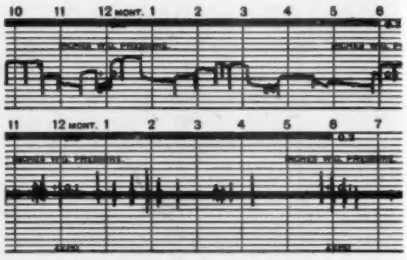

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